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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

September 15, 1987 Volume 1082 Number 3

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987 and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

International PCT fees were changed due to differences in the exchange rate and International PCT Chapter II fees effective July 1, 1987 were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

The national fees effective July 1, 1987 for entering the U.S. Patent and Trademark Office as a designated or elected Office as announced in the *Official Gazette* at 1079 O.G. 32, on June 16, 1987 are included for convenience of applicants.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee	150.00
Supplement to the handling fee	150.00

U.S. National Stage fees

	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

June 2, 1987.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on September 11, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,470,155 through 4,471,494
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and

(h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JUNE 28, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,389,743	06/276,173	6/28/83
4,389,753	06/308,431	6/28/83
4,389,774	06/281,813	6/28/83
4,389,782	06/352,939	6/28/83
4,389,790	06/254,691	6/28/83
4,389,792	06/225,402	6/28/83
4,389,795	06/255,767	6/28/83
4,389,802	06/320,330	6/28/83
4,389,810	06/371,972	6/28/83
4,389,813	06/228,469	6/28/83
4,389,816	06/247,221	6/28/83
4,389,835	06/289,528	6/28/83
4,389,836	06/281,421	6/28/83
4,389,838	06/375,724	6/28/83
4,389,842	06/245,144	6/28/83
4,389,844	06/272,568	6/28/83
4,389,846	06/318,369	6/28/83
4,389,849	06/308,204	6/28/83
4,389,874	06/245,711	6/28/83
4,389,877	06/248,552	6/28/83
4,389,883	06/298,165	6/28/83
4,389,887	06/271,639	6/28/83
4,389,900	06/219,705	6/28/83
4,389,905	06/287,144	6/28/83
4,389,913	06/239,987	6/28/83
4,389,918	06/267,126	6/28/83
4,389,926	06/273,433	6/28/83
4,389,963	06/247,806	6/28/83
4,389,964	06/322,235	6/28/83
4,389,977	06/290,327	6/28/83
4,389,978	06/272,035	6/28/83
4,389,984	06/247,900	6/28/83
4,389,985	06/233,952	6/28/83
4,389,988	06/251,289	6/28/83
4,389,989	06/279,668	6/28/83
4,389,990	06/305,353	6/28/83
4,390,009	06/379,185	6/28/83
4,390,014	06/310,889	6/28/83
4,390,015	06/223,254	6/28/83
4,390,017	06/290,820	6/28/83
4,390,030	06/328,855	6/28/83
4,390,037	06/371,242	6/28/83
4,390,048	06/277,717	6/28/83
4,390,051	06/250,605	6/28/83
4,390,057	06/259,093	6/28/83
4,390,060	06/285,430	6/28/83
4,390,061	06/221,534	6/28/83
4,390,070	06/266,864	6/28/83
4,390,078	06/351,439	6/28/83
4,390,085	06/295,321	6/28/83
4,390,087	06/299,725	6/28/83
4,390,089	06/240,907	6/28/83
4,390,093	06/248,977	6/28/83
4,390,095	06/236,779	6/28/83
4,390,096	06/254,023	6/28/83
4,390,101	06/219,800	6/28/83
4,390,108	06/320,384	6/28/83
4,390,113	06/353,217	6/28/83
4,390,115	06/249,112	6/28/83
4,390,140	06/242,766	6/28/83
4,390,142	06/291,356	6/28/83
4,390,144	06/230,898	6/28/83
4,390,145	06/236,566	6/28/83
4,390,146	06/245,050	6/28/83
4,390,147	06/295,769	6/28/83
4,390,154	06/307,370	6/28/83
4,390,157	06/230,441	6/28/83
4,390,159	06/257,753	6/28/83
4,390,161	06/240,096	6/28/83
4,390,163	06/387,952	6/28/83
4,390,164	06/305,026	6/28/83
4,390,168	06/324,587	6/28/83
4,390,170	06/359,774	6/28/83
4,390,179	06/279,530	6/28/83
4,390,183	06/324,176	6/28/83
4,390,190	06/297,506	6/28/83
4,390,195	06/236,839	6/28/83
4,390,211	06/326,035	6/28/83
4,390,222	06/301,308	6/28/83
4,390,271	06/330,117	6/28/83
4,390,285	06/292,213	6/28/83
4,390,304	06/365,198	6/28/83
4,390,312	06/237,088	6/28/83
4,390,313	06/247,274	6/28/83
4,390,322	06/233,217	6/28/83
4,390,323	06/347,034	6/28/83
4,390,338	06/322,422	6/28/83

Patent Number	Serial Number	Issue Date
4,390,381	06/376,669	6/28/83
4,390,389	06/338,624	6/28/83
4,390,390	06/258,964	6/28/83
4,390,397	06/334,656	6/28/83
4,390,400	06/266,951	6/28/83
4,390,403	06/286,387	6/28/83
4,390,408	06/278,226	6/28/83
4,390,417	06/285,197	6/28/83
4,390,427	06/301,317	6/28/83
4,390,434	06/391,592	6/28/83
4,390,435	06/396,252	6/28/83
4,390,462	06/322,726	6/28/83
4,390,463	06/322,872	6/28/83
4,390,464	06/366,091	6/28/83
4,390,469	06/258,384	6/28/83
4,390,479	06/394,518	6/28/83
4,390,485	06/337,852	6/28/83
4,390,486	06/245,563	6/28/83
4,390,491	06/361,593	6/28/83
4,390,498	06/284,198	6/28/83
4,390,518	06/254,723	6/28/83
4,390,529	06/221,647	6/28/83
4,390,537	06/379,604	6/28/83
4,390,538	06/297,884	6/28/83
4,390,540	06/292,315	6/28/83
4,390,541	06/327,146	6/28/83
4,390,564	06/294,774	6/28/83
4,390,583	06/350,776	6/28/83
4,390,604	06/278,896	6/28/83
4,390,619	06/306,322	6/28/83
4,390,620	06/216,911	6/28/83
4,390,643	06/299,168	6/28/83
4,390,649	06/349,781	6/28/83
4,390,661	06/382,945	6/28/83
4,390,704	06/281,042	6/28/83
4,390,705	06/343,861	6/28/83
4,390,715	06/282,190	6/28/83
4,390,730	06/287,384	6/28/83
4,390,733	06/263,598	6/28/83
4,390,737	06/316,781	6/28/83
4,390,743	06/301,322	6/28/83
4,390,755	06/272,373	6/28/83
4,390,758	06/225,752	6/28/83
4,390,759	06/255,040	6/28/83
4,390,760	06/340,352	6/28/83
4,390,761	06/226,079	6/28/83
4,390,770	06/286,390	6/28/83
4,390,774	06/247,112	6/28/83
4,390,800	06/280,052	6/28/83
4,390,804	06/275,517	6/28/83
4,390,820	06/298,973	6/28/83
4,390,822	06/288,681	6/28/83
4,390,828	06/359,021	6/28/83
4,390,854	06/239,955	6/28/83
4,390,857	06/326,090	6/28/83
4,390,860	06/286,242	6/28/83
4,390,861	06/242,742	6/28/83
4,390,875	06/359,135	6/28/83
4,390,892	06/313,163	6/28/83
4,390,920	06/331,610	6/28/83
4,390,922	06/345,920	6/28/83
4,390,927	06/379,928	6/28/83
4,390,928	06/288,781	6/28/83
4,390,976	06/228,847	6/28/83
4,390,978	06/279,183	6/28/83

Notification of Acceptance of Delayed Payment of Maintenance Fee (35 U.S.C. 41(c);37 CFR 1.378)

The patent listed below is considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenace fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,358,096	06/242,511	11/9/82	3/10/81	8/12/87

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,899,091, Re. S.N. 077,431, Filed July 24, 1987, Cl. 219/10.554, REFUSE COLLECTION APPARATUS, Fred T. Smith, Owner of Record: *Sargent Industries, Inc., Wayne, Mich.,* Attorney or Agent: Ellsworth R. Roston, et al., Ex. Gp.: 214

3,999,669, Re. S.N. 077,432, Filed July 24, 1987, Cl. 414/517, REFUSE COLLECTION APPARATUS, Fred T. Smith, Owner of Record: *Sargent Industries, Inc., Wayne, Mich.,* Attorney or Agent: Ellsworth R. Roston, et al., Ex. Gp.: 317

4,536,714, Re. S.N. 076,635, Filed July 23, 1987, Cl. 324/338, SHIELDS FOR ANTENNAS OF BOREHOLES LOGGING DEVICES, Brian Clark, Owner of Record: *Schlumberger Technology Corp., New York, N.Y.,* Attorney or Agent: Kenneth Olsen, Ex. Gp.: 267

4,587,940, Re. S.N. 076,464, Filed July 22, 1987, Cl. 123/503, FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES, Walter Schmid, Owner of Record: *Robert Bosch GmbH, Stuttgart, Germany,* Attorney or Agent: Edwin E. Greigg, et al., Ex. Gp.: 342

4,614,690, Re. S.N. 072,217, Filed July 10, 1987, Cl. 428/614, INORGANIC FIBER-REINFORCED METALLIC COMPOSITE MATERIAL, Takemi Yamamura, et al., Owner of Record: *Ube Industries Ltd., Ube, Japan,* Attorney or Agent: Leonard J. Robbins, et al., Ex. Gp.: 111

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,485,383, Reexam. No. 90/001,291, Requested: July 28, 1987, Cl. 212/195, AUXILIARY SUPPORT FOR CRANES, Daniel E. Beduhn, Owner of Record: *Manitowoc Co., Inc., Manitowoc, Minn.,* Attorney or Agent: Unknown, Ex. Gp.: 310, Requester: American Hoist & Derrick Co., St. Paul, Minn.

4,071,312, Reexam. No. 90/001,293, Requested: July 30, 1987, Cl. 8/648, GREEN-YELLOW TO ORANGE MONDAZO PAPER DYES, John Blackwell, Owner

of Record: *Mobay Corp., Pittsburgh, Pa.*, Attorney or Agent: Unknown, Ex. Gp.: 110, Requester: Owner

4,189,834, Reexam. No. 90/001,299, Requested: Aug. 3, 1987, Cl. 32/15, DENTAL REINFORCING PINS, Andrew J. Smith, Owner of Record: *Fairfax Dental Ltd., Dublin, Ireland,* Attorney or Agent: Beveridge, DeGrandi, et al., Ex. Gp.: 330, Requester: Berj A. Terzian, New York, N.Y.

4,200,866, Reexam. No. 90/001,292, Requested: July 27, 1987, Cl. 340/703, STROKE WRITTEN SHADOW-MASK MULTI-COLOR CRT DISPLAY SYSTEM, Lyle R. Strathman, Owner of Record: *Rockwell International Corp., El Segundo, Calif.,* Attorney or Agent: Unknown, Ex. Gp.: 260, Requester: Owner

4,330,122, Reexam. No. 90/001,265, Requested: June 18, 1987, Cl. 273/51, CONVERTIBLE BOWLING ALLEY, Zena Sheinberg, et al., Owner of Record: *Zena Sheinberg & Alex Wortman, Ann Arbor, Mich.,* Attorney or Agent: Myron Cohen, Ex. Gp.: 330, Requester: Shur-Scope, Inc., Clifton, N.J.

4,375,321, Reexam. No. 90/001,298, Requested: July 31, 1987, Cl. 354/23, EXPOSURE AMOUNT CONTROL DEVICE, Ryoichi Suzuki, et al., Owner of Record: *Canon Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Toren, McGeady, et al., Ex. Gp.: 210, Requester: Charles R. Donohoe, Washington, D.C.

4,394,329, Reexam. No. 90/001,297, Requested: Aug. 3, 1987, Cl. 558/484, 2-HYDROXYMETHYL-1,3-PROPANEDIOL NITRATE ESTER, Michael W. Barnes, Owner of Record: *Morton Thiokol, Inc., Chicago, Ill.,* Attorney or Agent: Gerald K. White, Ex. Gp.: 220, Requester: Owner

4,429,001, Reexam. No. 90/001,294, Requested: July 31, 1987, Cl. 428/283, SHEET PRODUCT CONTAINING SORBENT PARTICULATE MATERIAL, Barbara E. Kolpin, et al., Owner of Record: *Minnesota Mining & Mftg. Co., St. Paul, Minn.,* Attorney or Agent: Roger Tamte, Ex. Gp.: 150, Requester: Kimberly-Clark Corp., Roswell, Ga.

4,456,590, Reexam. No. 90/001,296, Requested: July 31, 1987, Cl. 424/101, HEAT TREATMENT OF LYOPHILEZED BLOOD CLOTTING FACTOR VIII CONCENTRATE, Alan Rubinstein, Owner of Record: *Cedars-Sinai Medical Ctr., Los Angeles, Calif.,* Attorney or Agent: Lyon & Lyon, Ex. Gp.: 120, Requester: Rorer Group, Inc., Fort Washington, Pa.

4,556,558, Reexam. No. 90/001,295, Requested: July 31, 1987, Cl. 424/101, TREATMENT OF FACTOR VIII CONCENTRATE TO MINIMIZE THE AFFECT OF UNDESIRABLE MICROORGANISMS, Alan Rubinstein, Owner of Record: *Cedars-Sinai Medical Ctr., Los Angeles, Calif.,* Attorney or Agent: Lyon & Lyon, Ex. Gp.: 120, Requester: Rorer Group, Inc., Fort Washington, Pa.

Use of Color Drawings in Utility Patents

This notice supersedes the Official Gazette notice, dated Aug. 6, 1986, published at 1070 O.G. 10 on Sept. 9, 1986.

Under 37 CFR 1.84, the drawings of a utility patent application must be in black and white. However, on occasion, color drawings may be appropriate. In this circumstance, the Patent and Trademark Office will entertain a petition under 37 CFR 1.183 to waive the requirements of §1.84 to the extent that color drawings on DIN size A4 sheets (21.0 by 29.7 cm.) will be accepted for the purposes and under the conditions set forth below.

The petition must be accompanied by five (5) sets of color drawings on DIN size A4 sheets (21.0 by 29.7 cm.) for examination, copying and archival purposes.

In light of the substantial administrative and economic burden associated with printing a utility patent with color drawings, the patent copies which are printed at issuance of the application will depict the drawings in black and white only. However, a set of color drawings will be attached to the Letters Patent. Moreover, copies of the patent with color drawings attached thereto will be provided by the Patent and Trademark Office upon special request and payment of the fee necessary to recover the actual costs associated therewith.

Accordingly, the petition must also be accompanied by a proposed amendment to insert the following language as the first paragraph in the portion of the specification containing a brief description of the drawings:

> The file of this patent contains at least one drawing executed in color. Copies of this patent with color drawing(s) will be provided by the Patent and Trademark Office upon request and payment of the necessary fee.

It is anticipated that such a petition will be granted only when the Patent and Trademark Office has determined that a color drawing is the only practical medium by which to disclose in a printed utility patent the subject matter sought to be patented.

It is emphasized that a decision to grant the petition should not be regarded as an indication that color drawings are necessary to comply with a statutory requirement. In this latter respect, clearly it is desirable to file any desired color drawings as part of the original application papers in order to avoid issues concerning statutory defects (e.g., lack of enablement under 35 USC 112 or new matter under 35 USC 132). The filing of the petition, however, may be deferred until acceptable drawings are required by the examiner.

The petition should be directed to the attention of the Office of the Deputy Assistant Commissioner for Patents.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

July 24, 1987.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Goodman & Suss Clothes Corp., New York, N.Y., Reg. No. 515,376, for the mark "TRANS-ATLANTIC", Canc. No. 16,088.

Dorothy Lee Vick (nee Dorothy Lee) dba Dottie Lee Bakeries, Amarillo, Tex., Reg. No. 575,260, for the mark "DOTTIE LEE & DESIGN", Canc. No. 16,032.

ERMA S. BROWN,
Administrator of the Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceedings sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

McMorris & Associates, Inc., dba Oh! Naturelle, Atlanta, Ga., Reg. No. 1,376,395, for the mark "OH! NATURELLE AND DESIGN", Canc. No. 16,228.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceedings sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Lourdes Garcia, dba Adopt-A-Pet, Peachtree City, Ga., Reg. No. 1,231,217, for the mark "ADOPT-A-PET (Plus other Notations) AND DESIGN", Canc. No. 16,274.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Sept. 15, 1987

D. 289,329	4,619,357	4,644,934	4,663,180
4,230,533	4,619,645	4,646,531	4,663,263
4,278,872	4,621,888	4,647,560	4,663,340
4,413,176	4,622,358	4,647,753	4,663,406
4,428,744	4,622,948	4,647,986	4,663,450
4,475,161	4,624,319	4,648,466	4,663,534
4,504,298	4,624,324	4,648,864	4,663,582
4,508,778	4,624,905	4,650,003	4,663,672
4,515,909	4,624,912	4,650,917	4,663,778
4,519,338	4,625,156	4,650,988	4,663,896
4,528,246	4,626,259	4,651,175	4,663,926
4,531,073	4,626,330	4,652,348	4,664,146
4,535,171	4,626,488	4,652,514	4,664,259
4,540,573	4,627,007	4,652,556	4,664,583
4,560,997	4,627,245	4,652,629	4,664,721
4,564,287	4,627,824	4,652,823	4,664,810
4,564,489	4,629,777	4,653,062	4,665,255
4,572,168	4,630,626	4,653,232	4,665,991
4,575,669	4,631,198	4,653,903	4,666,152
4,576,671	4,631,283	4,653,955	4,666,188
4,584,152	4,631,571	4,654,223	4,666,199
4,590,187	4,631,676	4,654,375	4,666,221
4,590,321	4,632,132	4,654,784	4,666,314
4,590,322	4,633,441	4,655,168	4,666,357
4,591,304	4,635,162	4,655,228	4,666,484
4,591,670	4,635,640	4,655,311	4,666,544
4,592,049	4,636,002	4,655,779	4,666,914
4,592,967	4,636,161	4,656,006	4,667,049
4,596,736	4,636,783	4,656,027	4,667,110
4,596,932	4,637,212	4,657,335	4,667,246
4,597,630	4,637,399	4,657,898	4,667,906
4,599,311	4,637,560	4,658,275	4,667,931
4,600,503	4,637,889	4,658,959	4,668,086
4,603,220	4,638,209	4,659,014	4,668,256
4,605,102	4,638,930	4,659,517	4,668,496
4,606,196	4,639,920	4,661,284	4,668,562
4,608,254	4,640,531	4,661,910	4,670,287
4,609,673	4,640,810	4,662,071	4,670,510
4,610,126	4,641,739	4,662,202	4,673,115
4,610,288	4,641,892	4,662,453	4,673,572
4,611,059	4,643,771	4,662,834	4,679,453
4,618,619	4,644,001	4,663,065	

Disclaimers

4,108,837.—*Robert N. Johnson*, New Market; *Alford G. Farnham*, Mendham, both of N.J. POLYARYLENE POLYETHERS. Patent dated Aug. 22, 1978. Disclaimer filed Apr. 30, 1987, by the assignee, *Amoco Corp.*

Hereby enters this disclaimer to claim 58 of said patent.

4,124,570.—*Anthony S. Scheibelhoffer*, Norton; *Richard E. Meier*, Stow, both of Ohio. POLY(NEOPENTYL TEREPHTHALATE/TRIMELLITATE)THERMOSETTING RESIN. Patent dated Nov. 7, 1978. Disclaimer filed July 20, 1987, by the assignee, *The Goodyear Tire & Rubber Co.*

Hereby enters this disclaimer to all claims of said patent.

4,513,699.—*Gyula Cser*, Budapest, Hungary. INTAKE GAS RESONANCE SYSTEM FOR INTERNAL COMBUSTION ENGINES. Patent dated Apr. 30, 1985. Disclaimer filed May 8, 1987, by the assignee, *Autoipari Kutato es Fejleszto Vallalat.*

Hereby enters this disclaimer to claim 3 of said patent.

4,538,437.—*Robert E. Wisebaker*, Tiffin, Ohio. FORGING MACHINE KICKOUT DRIVE WITH RUNNING ADJUSTMENT. Patent dated Sept. 3, 1985. Disclaimer filed June 1, 1987, by the assignee, *National Machinery Co.*

Hereby enters this disclaimer to claims 1, 2, 3 and 11 of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

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Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext. 21
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Alaska	Anchorage Municipal Libraries	(907) 261-2907
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7140
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4222
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
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	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF August 15, 1987

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-13-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-30-86
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-29-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-30-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-07-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	11-4-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	8-16-85
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-10-85
DESIGN, GROUP 290—K. L. CAGE, Director	1-14-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	3-25-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-15-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	5-28-86
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during August 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,522,401 to 3,526,003, inclusive

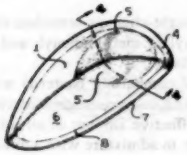
Plant Patents ..... Numbers 2,986 to 2,988 inclusive

REEXAMINATIONS

SEPTEMBER 15, 1987

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,166,328 (757th)
SHOE REPAIR DEVICE
James C. Hamilton, 6307 Valley Rd., Bethesda, Md. 20034
Reexamination Request No. 90/001,151, Jan. 14, 1987.
Reexamination Certificate for Patent No. 4,166,328, issued Sep. 4, 1979, Ser. No. 781,568, Mar. 28, 1977.
Int. Cl.[4] A43B *13/22, 5/00*
U.S. Cl. 36—72 R



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–7** is confirmed.

1. A device for covering a worn area on a shoe comprising

an opened topped member of flexible material having a side wall and a bottom member lying in a plane generally at right angles to said side wall,

said side wall having an upper edge and extending from a first region of the shoe intended to lie under the ball of the foot of the foot of the wearer and terminating at a second region adjacent the longitudinal center of the front of the shoe,

said side wall having a generally straight section along the side of the shoe and a section of increasing curvature adjacent the intended location of the big toe of the wearer whereby the curvature of said side wall conforms to the side of the shoe between said first and second regions,

said bottom member having an outer edge extending between said ends of said side wall, and

said device having a region of maximum thickness in the region of said device intended to lie both under the big toe and forward of the big toe of the wearer of the shoe,

said device tapering from said maximum thickness to a lesser thickness at said upper edge, said first and second regions and said outer edge.

B1 4,225,345 (758th)
PROCESS FOR FORMING METAL PARTS WITH LESS THAN 1 PERCENT CARBON CONTENT
James M. Adee, San Diego, and John A. MacPherson, Chula Vista, both of Calif., assignors to Form Physics Corp., San Diego, Calif.
Reexamination Request No. 90/000,961, Feb. 18, 1986.
Reexamination Certificate for Patent No. 4,225,345, issued Sep. 30, 1980, Ser. No. 931,966, Aug. 8, 1978.
Int. Cl.[4] B22F *1/00*
U.S. Cl. 419—36

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–9** is confirmed.

New claims **10–24** are added and determined to be patentable.

1. A process for forming a metal part having a carbon content of less than 1% comprised of the steps of:

forming a substantially uniform mixture comprised of a powdered metal, a plasticizer, at least one first binder which is selectively extractable from said mixture without sintering and at least one further binder which is not removable by said selective extraction,

the total quantities of said binders and plasticizer being selected to form a readily moldable mixture and the quantity of binder not removable by said selective extraction being sufficient to maintain the shape of the molded mixture but less than that forming a carbon content of 1.0% after sintering;

shaping said mixture into said part;

removing said plasticizer and extractable binder from said part without sintering to form a porous part having a reduced binder content which, when decomposed by sintering, leaves said part with less than said predetermined carbon content; and

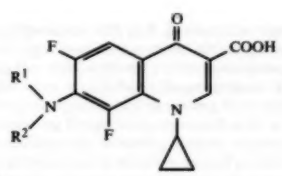
heating said porous part at a temperature and in an atmosphere to decompose and remove residual binder to a carbon content less than 1% and to sinter said powdered metal into a shaped metal part.

B1 4,556,658 (759th)
7-AMINO-1-CYCLOPROPYL-6,8-DIFLUORO-1,4-DIHYDRO-4-OXO-QUINOLINE-3-CARBOXYLIC ACIDS AND ANTIBACTERIAL AGENTS CONTAINING THESE COMPOUNDS
Klaus Grohe, Odenthal; Uwe Petersen, Leverkusen; Hans-Joachim Zeiler, Velbert, and Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Reexamination Request No. 90/000,981, Apr. 7, 1986.
Reexamination Certificate for Patent No. 4,556,658, issued Dec. 3, 1985, Ser. No. 603,480, Apr. 24, 1984.
Claims priority, application Fed. Rep. of Germany, May 18, 1983, 3318145
Int. Cl.[4] A61K *31/495*
U.S. Cl. 514—254

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–17** is confirmed.

1. A 7-amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-4-oxo-quinolinecarboxylic acid of the formula (I)



(I)

in which

R^1 and R^2 are identical or different and represent a C_1–C_4-alkyl radical which is optionally substituted by a hy-

droxyl, amino, methylamino or dimethylamino group, and R^1 and R^2, together with the nitrogen atom to which they are bonded, furthermore form a 5-membered or 6-membered heterocyclic ring, which can additionally have, as a ring member, the atoms or groups —O—, —S—, —SO—, —SO_2— or >N-R^3 and which is optionally monosubstituted, disubstituted or trisubstituted at the carbon atoms by C_1–C_4-alkyl, hydroxyl, alkoxy having 1–3 carbon atoms, amino, methylamino or ethylamino, and each carbon atom carries no more than one substituent, and R^3 represents hydrogen, a branched or straight-chain alkyl, alkenyl or alkinyl group with has 1 to 6 carbon atoms and is optionally substituted by a hydroxyl, trifluoromethylmercapto, alkoxy, alkylmercapto, alkylamino or dialkylamino group having 1 to 3 carbon atoms per alkyl radical, the cyano group or the alkoxycarbonyl group having 1 to 4 carbon atoms in the alcohol part, or represents the benzyloxycarbonyl group, a phenylalkyl group which has up to 4 carbon atoms in the aliphatic part and is optionally substituted in the phenyl radical by nitro or amino, a phenyl radical which is optionally monosubstituted or disubstituted by hydroxyl, methoxy, chlorine or fluorine, a phenylacyl radical which is optionally monosubstituted or disubstituted by hydroxyl, methoxy, chlorine and fluorine, an oxoalkyl radical having up to 6 carbon atoms and a cycloalkyl-alkyl radical having up to 6 carbon atoms in the cyclic part and up to 3 carbon atoms in the acyclic part, and furthermore denotes a radical COR^4, CN or SO_2R^5,

wherein

R^4 represents hydrogen or straight-chain or branched alkyl which has 1 to 4 C atoms and is optionally substituted by 1 or 2 substituents selected from amino, alkoxycarbonyl having 1 to 3 carbon atoms in the alkyl part, carboxyl, alkoxy having 1 to 3 carbon atoms and trifluoromethylthio, or represents phenyl which is optionally substituted by chlorine, hydroxyl, amino or carboxyl, or represents alkoxy having 1 to 4 C atoms, alkylthio having 1 to 2 C atoms, benzyloxy or amino, or represents alkylamino which has 1 to 5 C atoms and is optionally substituted by alkoxycarbonyl having 1 to 3 C atoms in the alkyl part or carboxyl, and

R^5 represents straight-chain or branched alkyl having 1 to 3 C atoms, phenyl or methylphenyl, and its pharmaceutically useful salts.

15. A method of combatting bacterial infection in warm-blooded animals which comprises administering to said animals an antibacterially effective amount of an active compound of claim **1** either alone, in admixture with a diluent or in the form of a medicament.

REISSUES

SEPTEMBER 15, 1987

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,500
BUTTON HAVING PLASTIC RESIN HEAD

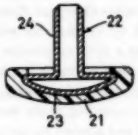
Akihiko Takata, Fujisawa, Japan, assignor to Scovill Japan Kabushiki Kaisha, Tokyo, Japan

Original No. 4,580,320, dated Apr. 8, 1986, Ser. No. 593,345, Mar. 26, 1984. Application for reissue Aug. 15, 1986, Ser. No. 897,173

Claims priority, application Japan, May 9, 1983, 58-67842[U]

Int. Cl.[4] A44B *1/12*

U.S. Cl. 24—113 MP **12 Claims**



1. An attaching button for attaching a fastener member to a fabric by the application of a mechanical force comprising:

a button head of rigid polyester resin with an outer surface and an internal cavity having an inlet and an internally expanded surface, and

a metallic leg piece comprised of a generally hollow base and at least one leg, said base being generally circular in cross section and having an outer periphery at least slight larger in diameter than the inlet of the cavity, said base having a first surface shaped to complement the internal surface of said cavity and a second generally flat annular surface, said at least one leg extending outwardly from said second base surface [proximate the outer periphery thereof].

Re. 32,501
ROTARY CUTTER

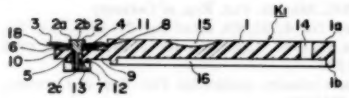
Yoshio Okada, Osaka, Japan, assignor to Okada Kogyo Kabushiki Kaisha, Osaka, Japan

Original No. 4,432,137, dated Feb. 21, 1984, Ser. No. 408,718, Aug. 16, 1982. Application for reissue Feb. 19, 1986, Ser. No. 830,886

Claims priority, application Japan, Sep. 29, 1981, 56-145180[U]

Int. Cl.[4] B26B *3/00*

U.S. Cl. 30—292 **16 Claims**



1. A rotary cutter comprising:

a disc blade having a central opening;

an elongated handle having, *at its one end, a platform for rotatably supporting said disc blade, said platform having* an aperture extending *therethrough and a bearing means for frictionally supporting an inner surface of said disc blade at only one of a central portion and a peripheral portion of said disc blade said inner surface at the other of said central portion and said peripheral portion being unsupported;* [through one end thereof;

said handle being formed with a bearing projection coaxial with said aperture;]

a shaft [having] *which extends through the central opening of said disc blade and the aperture of said platform and which has, at its one end,* a head portion [at one end thereof], which [extends through said aperture so as to be supported by said handle] *frictionally supports an outer surface of said disc blade only at the other one of the central portion and the peripheral portion of the disc blade, said outer surface of the one of said central portion and said peripheral portion being unsupported; and*

[a disc blade having a central opening, which is rotatably mounted on said shaft in a plane perpendicular to the longitudinal axis of said shaft with said shaft extending through said central opening so that said disc blade may be caused to roll on a material to be cut during a cutting operation;

said disc blade being interposed between said head portion and said bearing projection, said bearing projection and said head portion respectively bearing on said disc blade at radially spaced locations on opposite sides of said disc blade; and]

a [fastening member engageable with] *securing means for securing* said shaft [for urging said head portion against] *to said platform so as to urge* said disc blade [so as to urge said disc blade against said bearing projection, whereby] *towards said platform such that* said disc blade is subjected to curved elastic deformation [between said radially spaced locations and is caused to rotate in the curved state].

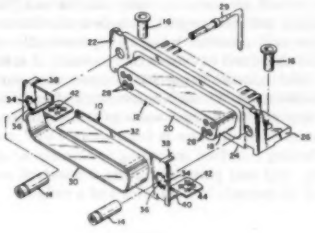
Re. 32,502
GROUNDING MATING HARDWARE

Vijay Kumar, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Original No. 4,512,618, dated Apr. 23, 1985, Ser. No. 473,935, Mar. 10, 1983. Application for reissue Oct. 3, 1985, Ser. No. 783,985

Int. Cl.[4] H01R *4/66, 13/648*

U.S. Cl. 439—92 **7 Claims**



1. [In combination with an] *An* electrical connector having a housing of rigid insulative material defining a mating face and a mounting face with a plurality of terminal passages extending between the faces, a peripheral flange around said mating face and mounting flanges on said mounting face, each said peripheral and mounting flange being provided with at least one hole to receive locking and mounting means, respectively, therein, a plurality of electrical terminals mounted in said housing, each terminal having a mating portion directed toward the mating face and a mounting portion extending from the mounting face, a metal shell providing grounding interconnect between a *complementary* shielded connector and [the] *a* mounting

surface [characterized by a unitary metallic member], *said metal shell* having a shroud portion encircling the mating face to engage shielding of said *complementary* shielded connector [and], an integral flange extending normal to [the axis of] the shroud portion, [at least one mounting tab extending from a first edge of said flange adapted to engage one edge of said peripheral flange of said housing] and at least one [mounting tab] *ground strap* adapted to lie adjacent said mounting face, [each] *characterized by* said *integral* flange and said [mounting tab] *ground strap* being provided with [a profiled aperture providing] *an aperture having inwardly directed tines which provide* wiping engagement between the shell and the respective locking means and mounting means.

Re. 32,503

SILICIC ACID FOR THE FILTRATION OF BEVERAGES PARTICULARLY BEER

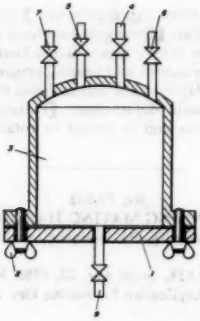
Gerhard Steenken, Berzbuir bei Duren, Fed. Rep. of Germany, assignor to Akzona Incorporated, New York, N.Y.

Original No. 4,457,900, dated Jul. 3, 1984, Ser. No. 373,476, Apr. 30, 1982. Application for reissue Nov. 8, 1984, Ser. No. 669,576

Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117345

Int. Cl.[4] C01B *33/12;* **B01D** *39/14*

U.S. Cl. 423—339 **20 Claims**



1. Process for the preparation of finely divided silicic acid particles, which are simultaneously suitable as a filtering auxiliary and as a stabilizing agent for beer in the filtration thereof, said silicic acid particles being of an essentially spherical or spheroidal shape and having an SiO_2 content of at least 95% by weight, said content being based upon said particles after drying at about 110° C., an Na_2O content of less than 0.25% by weight, and wherein the pH value of said particles comprising a 10% suspension in water is from about 4 to 7, said particles further having a surface according to Carman no greater than 100 m^2/g. and said particles having a standard test filtration time t_o of 20 seconds to 6 minutes and a ratio of

$$t\frac{1000}{120}/t_o$$

of about 0.7 to 6.5, with

$$t\frac{1000}{120}$$

being the test filtration time after a stirring stress of 120 minutes at 1000 rpm, comprising forming an aqueous charge containing 0.4 to 2.0% dissolved common salt by weight, said charge being between 33% and 70% by volume of the final volume of said charge and said silicic acid after precipitation of particles of said silicic acid, and wherein said aqueous charge has added uniformly and separately thereto a sodium silicate solution and an acid to form a silicic acid suspension that contains said silicic acid, said sodium silicate solution being metered into said charge whereby the pH value in the charge is about 3 to 10 during the addition, the temperature of said charge being maintained between about 50° C. and 95° C. during said addition, adjusting the pH value of said silicic acid suspension to about 7 to 4 after termination of the addition, filtering said silicic acid, washing said silicic acid with water and immediately drying said silicic acid while avoiding elevated shear stresses, followed by screening said acid in the absence of grinding with the aid of a sieving device.

6. Finely divided non-crystalline silicic acid particles, which are simultaneously suitable as a filtering auxiliary and as a stabilizing agent for beer in the filtration thereof, said silicic acid particles being of an essentially spherical or spheroidal shape and having an SiO_2 content of at least 95% by weight, said content being based upon said particles after drying at about 100° C., an Na_2O content of less than 0.25% by weight, and wherein the pH value of said particles comprising a 10% suspension in water is from about 4 to 7, said particles further having a surface according to Carman no greater than 100 m^2/g., said particles having a particle size distribution determined according to the method of screen analysis with a set of ultrasound wet screens pursuant to Seitz, with a residue of at least 60% with a hole size of 40μ, a residue of about 1 to 5% with a hole size of 5μ, and an ultra-fine constituent below 5μ no greater than 5%, said particles being made from an aqueous charge containing 0.4 to 2.0 weight percent dissolved common salt and having a volume of 33–70% of the final volume of the silicic acid suspension, said aqueous charge having added uniformly and separately thereto a sodium silicate solution and an acid to form said silicic acid suspension, said particles having a standard test filtration time t_o of 20 seconds to 6 minutes and a ratio of

$$t\frac{1000}{120}/t_o$$

of about 0.7 to 6.5 with

$$t\frac{1000}{120}$$

being the test filtration time stress of 120 minutes at 1000 rpm, said particles being prepared by wet precipitation and drying while avoiding elevated shear stresses to form a dried mass and in the absence of grinding of said dried mass.

Re. 32,504

ROOM TEMPERATURE STABLE ORGANOPOLYSILOXANE COMPOSITIONS

Ulrich Michel, Burghausen, and Josef Radecker, Emmerting, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

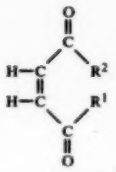
Original No. 4,530,989, dated Jul. 23, 1985, Ser. No. 590,314, Mar. 16, 1984. Application for reissue May 30, 1986, Ser. No. 868,990

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1983, 3315060

Int. Cl.[4] C08G *77/06*

U.S. Cl. 528—15 **14 Claims**

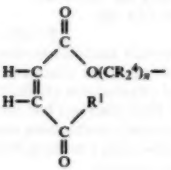
1. A crosslinkable organopolysiloxane composition comprising an organosilicon compound having Si-bonded hydrogen atoms, in organosilicon compound having aliphatic multiple bonds, a platinum catalyst capable of promoting the addition of the Si-bonded hydrogen atoms to the aliphatic multiple bonds and an inhibitor which delays or prevents crosslinking at room temperature which is selected from the group consisting of maleinimide and a maleic acid derivative selected from the group consisting of



and $R^6(SiR_2^7O)_x(SiR^7R^6O)_ySiR_2^7R_6$, where R^1 is [selected from the group consisting of a hydroxyl group and] a trimethylsiloxy group, R^2 is a radical selected from the group consisting of a hydrocarbonoxy radical which is bonded to the carbon atom of the

group and a hydrocarbonoxy radical which is bonded to the carbon atom of the

group and is substituted with at least one triorganosilyl group, at least one R^6 is a radical of the formula



and the other R^6 radicals are selected from the group consisting of the formula

$$-O(CR_2^4)_nOH$$

and R^7, where R^1 is the same as above, R^4 is selected from the group consisting of hydrogen and an alkyl radical having from 1 to 6 carbon atoms per radical, R^7 is selected from the group consisting of phenyl and alkyl radicals having 2 or 3 carbon atoms per radical and halogenated phenyl and alkyl radicals having 2 or 3 carbon atoms per radical, n is an integer having a value of from 3 to 19, x is 0 or an integer having a value of from 1 to 200 and y is an integer having a value of from 1 to 10.

Re. 32,505

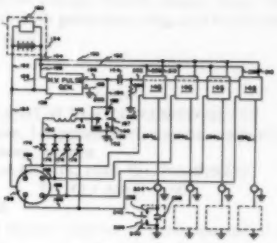
COMBUSTION INITIATION SYSTEM

George H. Hensley, Star Route, Box 150L, Alameda, N. Mex. 87114, and Raymond E. Hensley, 3805 Garcia Northeast, Albuquerque, N. Mex. 87111

Original No. 4,333,125, dated Jun. 1, 1982, Ser. No. 119,869, Feb. 8, 1980. Application for reissue Jun. 1, 1984, Ser. No. 616,509

Int. Cl.[4] F23Q *3/00*

U.S. Cl. 361—257 **63 Claims**



1. A device for generating a high energy plasma jet for initiating combustion of fuel, comprising:

a first electrode including a rod shaped member and a tip on one extremity of said rod shaped member; [and]

a second electrode electrically insulated from said first electrode and including an annular portion circumscribing the longitudinal axis of said rod shaped member,

said tip being substantially spaced along said longitudinal axis from said annular portion of said second electrode,

said tip and said annular portion defining an annular space therebetween across which electrical current may flow to produce an annularly shaped electrical discharge for initiating combustion of said fuel, the longitudinal spacing between said tip and said annular [position] *portion* being sufficient to allow said discharge to generate [a generally cylindrical] *an* electromagnetic field [surrounding said discharge and sufficient in strength to temporarily radially confine] *for urging* said discharge *radially outward from said longitudinal axis; and*

means continuous with said first and second electrodes for temporarily storing a quantity of electrical energy therein sufficient to produce said electrical discharge, said device having an inherent inductance sufficiently low to result in the discharge of the stored quantity of electrical energy across said annular space within **60** nanoseconds .

PLANT PATENTS

GRANTED SEPTEMBER 15, 1987

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,010
ROSE PLANT JACSIL

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Oct. 30, 1985, Ser. No. 792,908
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—22 **1 Claim**

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its unusual pale lavender color (near silver) coupled with attractive dark green foliage, few prickles, high cut flower production and a vigorous upright habit of growth.

6,011
ROSE PLANT JACLIP

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Oct. 30, 1985, Ser. No. 792,909
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its very dense and compact habit of growth, small glossy leaves, continuous production of attractive pink flower clusters which combine to produce a plant with outstanding landscape appeal.

6,012
GERANIUM PLANT NAMED MACY

Wolfgang Kirmann, Langenzersdorf, Austria, assignor to Mirko Vavra, Bisamberg, Austria

Filed Dec. 19, 1985, Ser. No. 810,674
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of geranium named Macy, as described and illustrated, and particularly characterized by its bright red-purple flower color, variegated with scarlet red; compact, self-branching growth habit; early flowering; good bud production at night temperatures up to 16° C., thus providing a long and continuous flowering period; and ease of propagation and good rooting habit.

6,013
BEGONIA PLANT NAMED CHEERS

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Dec. 10, 1985, Ser. No. 807,332
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of begonia named Cheers, as described and illustrated, and particularly characterized by its rose-red flower color, strong and upright petioles which support flowers above foliage, double flower form, floriferous habit, fast growth with good branching, and by its adaptability to 10 or 15 cm. pots.

6,014
GERANIUM PLANT NAMED BETTY

Wolfgang Kirmann, Langenzersdorf, Austria, assignor to Mirko Vavra, Bisamberg, Austria

Filed Dec. 19, 1985, Ser. No. 810,671
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of geranium named Betty, as described and illustrated, and particularly characterized by its white flower color, variegated with deep purple; medium green foliage; compact, self-branching growth habit; early flowering; good bud production at night temperatures up to 16° C., thus providing a long and continuous flowering period; and ease of propagation.

6,015
GERANIUM PLANT NAMED SHIRLEY

Wolfgang Kirmann, Langenzersdorf, Austria, assignor to Mirko Vavra, Bisamberg, Austria

Filed Dec. 19, 1985, Ser. No. 810,673
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of geranium named Shirley, as described and illustrated, and particularly characterized by its bright red flower color; compact, self-branching growth habit; early flowering; good bud production at night temperatures up to 16° C., thus providing a long and continuous flowering period; and ease of propagation and good rooting habit.

6,016
SYNGONIUM PLANT NAMED ANGELWING

Michael R. Broyles, Houston, Tex., assignor to Casa Flora, Inc., Dallas, Tex.

Filed Dec. 12, 1985, Ser. No. 808,438
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of *Syngonium podophyllum* named Angelwing as illustrated and described, and particularly characterized by its clumping habit, vigorous, full and compact growth habit, short nodes, lack of vining habit, long and narrow leaves with a slight sheen, ease of propagation, less inclination to damage at retail outlets due to lack of vines, adaptability to various pot sizes, and its tolerance to lower light levels which make it adaptable to large scale use in interiorscape plantings.

PLANT PATENTS

GRANTED SEPTEMBER 15, 1931

PATENTS

GRANTED SEP. 15, 1987

ERRATA

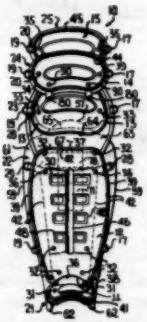
For CLASS	See PATENT NO.
437-175	4,692,991
437-057	4,692,992
437-053	4,692,993
437-040	4,692,994
437-041	4,692,995
437-073	4,692,996
437-238	4,692,997
437-225	4,692,998
128-663	4,693,319
137-013	4,693,321
098-002	4,693,417
251-129	4,693,447
439-013	4,693,527
439-083	4,693,528
439-067	4,693,529
439-067	4,693,530
439-512	4,693,531
439-594	4,693,532
439-350	4,693,533
439-276	4,693,534
439-277	4,693,535
439-404	4,693,536
439-399	4,693,537
439-460	4,693,538
439-465	4,693,539
439-198	4,693,540
439-626	4,693,542
437-174	4,693,758
437-024	4,693,759
409-244	4,693,813
512-014	4,693,844
514-009	4,693,845
564-236	4,694,086
380-014	4,694,335

PATENTS

GRANTED SEPTEMBER 15, 1987

GENERAL AND MECHANICAL

4,692,946
BASEBALL CATCHER'S LEG GUARD
Stanley M. Jurga, Shirley, Mass., assignor to George Frost Company, Shirley, Mass.
Filed Jul. 31, 1986, Ser. No. 891,319
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—22 **38 Claims**



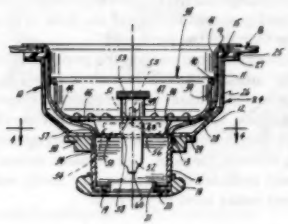
1. A protective leg guard comprising a relatively rigid foot guard, shin guard, knee guard and first and second thigh guards; means for pivotally connecting said shin guard to and between said foot and knee guards, a relatively thick resilient protective foot pad, shin pad and knee pad; means for joining said protective foot, shin and knee pads to said respective foot, shin and knee guards; said shin guard having a peripheral edge defined by an upper edge, a lower concave edge and opposite convex side edges; said shin pad having a peripheral edge defined by an upper edge, a lower concave edge and opposite side edges; each shin pad side edge merging with said shin pad lower concave edge at a lowermost convex radius edge and setting-off therewith an ankle bone protective pad portion of each shin pad projecting appreciably downwardly beyond said shin guard lower edge; each shin pad side edge merging with said shin pad upper edge at an uppermost convex radius edge and setting-off therewith an upper calf protective pad portion of each shin pad projecting appreciably rearwardly beyond the associated shin guard side edges; and said shin pad side edges project rearwardly appreciably beyond said shin guard side edges to set-off therewith relatively rearwardly broad and long inner and outer calf protective pad portions of said shin pad.

4,692,947
PROTECTIVE HELMET, CHIN CUP, AND FACE GUARD
Randy D. Black, 532 Smith Rd., Knoxville, Tenn. 37922, and Walter F. Tomczak, 7450 Fairway Rd., Leesburg, Fla. 32788
Filed Oct. 28, 1985, Ser. No. 792,002
Int. Cl.[4] A42B *3/00*
U.S. Cl. 2—421 **10 Claims**

1. A protective headgear, comprising:
a shell for receiving a wearer's head, and having opposed sides;
a cup to receive the wearer's chin; and
strap means connecting the cup to the shell, said strap means having a first strap segment with one end fixedly attached to one side of the shell and extending to the cup, and a second strap segment having one end releasably attached to the same side of the shell and extending to the cup, including means for securing a face guard to the shell, and

in which the one end of the first strap segment is attached intermediate the securing means and the shell.

4,692,948
SINK STRAINER HAVING A MAGNET
Joseph R. Martin, Highland Beach, Fla., assignor to Jomar International, Ltd., Royal Oak, Mich.
Filed Dec. 22, 1986, Ser. No. 945,029
Int. Cl.[4] E03C *1/26*
U.S. Cl. 4—286 **4 Claims**



1. A sink strainer comprising:
(a) a strainer body having a hollow upper portion and an outlet portion at its lower end;
(b) said outlet portion having an outlet plate of a magnetically attracting material provided with openings for liquid drainage therethrough;
(c) a basket strainer operatively mounted within said hollow body and manually movable between an opened position and a closed position;
(d) said basket strainer having drainage holes formed therethrough and having a rubber stopper on the bottom thereof, for seating on said outlet plate to close the drainage holes in the outlet plate when the basket strainer is in the closed position; and
(e) a permanent magnet means embedded within said rubber stopper carried by said sink strainer for magnetically attracting the basket strainer to the sink strainer body outlet plate to assist the water in the sink in creating an efficient sealing action between the rubber stopper and the outlet plate.

4,692,949

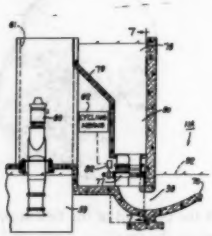
HIGH-HEAD, LOW-VOLUME SURFING WAVE POOL

George W. Dunn, Chula Vista, Calif., assignor to WaveTek International, Inc., Mansfield, Ohio

Continuation of Ser. No. 807,774, Dec. 11, 1985, abandoned, which is a continuation of Ser. No. 612,743, May 21, 1984, abandoned. This application Aug. 15, 1986, Ser. No. 897,149

Int. Cl.[4] A47K *3/10*

U.S. Cl. 4—491 9 Claims



1. A high head, low volume surfing wave pool comprising:

a pool for containing water at a nominal level and having a deep end and a shallow end;

at least one water inlet opening in the deep end of the pool below the nominal water level;

elevated reservoir means for containing water periodically with a water head above the nominal water level of the pool;

a conduit connecting a lower portion of the reservoir with the water inlet opening in the deep end of the pool;

the conduit including walls defining a vertical passage extending from at least ten feet above the nominal water level of the pool and with a cross-sectional area less than one-half of the maximum cross-sectional area of the reservoir;

valve means disposed in the conduit movable between open and closed positions to control the flow of water between the reservoir and the pool; and

actuator means located outside the pool, conduit and reservoir for moving the valve means between the closed position in which water is retained in the reservoir and the open position in which water flows from the reservoir through the conduit into the water inlet opening to form a surfing wave in the pool, said actuator means including a hydraulic cylinder located in a dry room and above the quiescent water level of the pool.

4,692,950

HYDROTHERAPY MASSAGE METHOD AND APPARATUS

Melvyn L. Henkin, 5011 Donna Ave., Tarzana, Calif. 91356, and Jordan M. Laby, 3038 Bayshore, Ventura, Calif. 93001

Filed Nov. 12, 1985, Ser. No. 796,987

Int. Cl.[4] A61H *33/02*

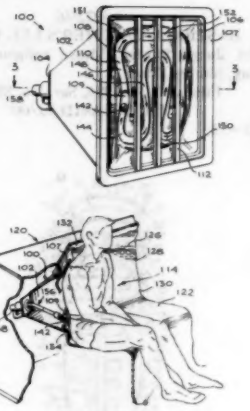
U.S. Cl. 4—542 60 Claims

1. Hydrotherapy apparatus for discharging a fluid stream useful for impacting against and massaging an area of a user's body, said apparatus comprising:

fluid supply means;

nozzle means defining a discharge orifice;

conduit means coupling said fluid supply means to said nozzle means for carrying a fluid stream for discharge through said orifice;



means mounting said nozzle means for movement along a nonlinear and noncircular path; and

thrust means for moving said nozzle means along said path.

4,692,951

SANITARY FACILITY ROOM FOR CLEAN ROOM

Masaru Taki; Hiroshi Okada; Seijiro Kawamura; Akio Kusumoto; Koji Morita, all of Fukuoka; Takao Ikenaga, Kanagawa; Toshifumi Shigematsu, Kanagawa, and Masami Iida, Kanagawa, all of Japan, assignors to Toto Ltd., Fukuoka, Japan

Filed Oct. 24, 1985, Ser. No. 791,155

Claims priority, application Japan, Oct. 31, 1984, 59-230852; Oct. 31, 1984, 59-230860

Int. Cl.[4] A47K *4/00;* E03D *9/04*

U.S. Cl. 4—664 31 Claims

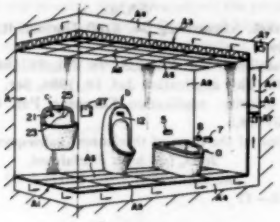
1. A sanitary facility room adapted to be placed within a clean room, said sanitary facility room comprising:

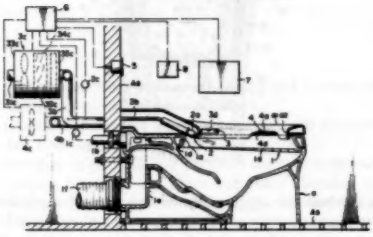
(a) an enclosure including a plurality of upstanding vertical walls, a floor, and a ceiling;

(b) at least one toilet apparatus, said toilet apparatus including means for sensing the presence of a human body using said toilet apparatus, a toilet control device operable in response to signals emitted by said sensing means, and means for supplying water to the interior of said toilet apparatus, said control device comprising means for controlling the amount of clean water supplied to the interior of said toilet apparatus, said means for supplying water comprising means for forming a film of water along an interior surface of said toilet apparatus; and

(c) means for cleaning the hands of said human body, said cleaning means comprising means for sensing the presence of hands of said human allong the interior of a bowl forming part of said cleaning means, a whasing control device operable in response to a signal sent to it by said hands sensing means, means for supplying water to the interior surface of said bowl and for forming a water film along said interior bowl surface, wherein said bowl washing control device comprises means for controlling the water supplied to said interior surface of said bowl by said bowl water supply means, wherein said enclosure, said toilet

apparatus, and said cleaning means together comprise means for permitting a user to utilize said toilet apparatus





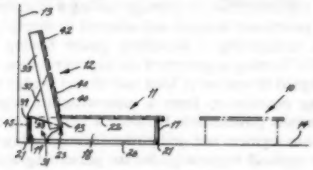
and said cleaning means without touching any object within said sanitary facility room.

4,692,952

SLATTED SOFA-BED CONSTRUCTION

Christine A. Dougher, 3908 Shenandoah, St. Louis, Mo. 63110, and Mary L. Rath, Rte. 1, Belle, Mo. 65013

Filed Nov. 12, 1985, Ser. No. 797,009
Int. Cl.[4] A47C *17/04*
U.S. Cl. 5—37 R **6 Claims**



1. Cross-slatted sofa bed construction comprising

a seat section including a foot portion,

a head rail opposite said foot portion,

vertically-extending side rails securing said head rail to said foot portion,

said side rails having longitudinal skid means along their lower edges, whereby to permit sliding movement of said seat section along a floor, and

a slot into the upper edge of each said side rail extending slantingly toward the foot portion and downward from the side rail upper edge and having forward and rear slot surfaces terminating in a slot base substantially above the lower edge of said side rails, the said slots being positioned spacedly from the head rail a distance substantially equal to the depth of said side rails,

said side rails having cross-slats affixed to their upper edges over only that area extending from said foot portion to said slots, whereby to provide an opening from said slots to the head rail, in combination with

a back section comprising left and right back rails so spaced from each other as to be out of correspondence with the spacing of said rails of said seat section, further comprising

a plurality of back cross slats extending across said back rails from a top back slat to a slat in lowermost position when the back section is erected, the end portions of said lowermost position slat being of such thickness as to fit slidably within said slanting slots and be there supported with the lowermost edges thereof resting on said slot bases,

the said back section left and right rails having support means, adjacent to said lowermost position slat, whose depth, measured from said slat, is substantially equal the combined depth of said seat section side rails and their said skid means,

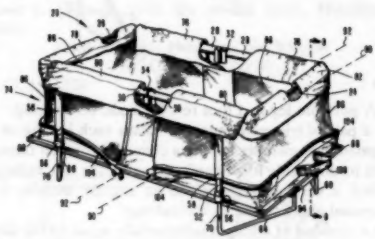
whereby said back section may be erected to serve as a sofa back with its top slat adjacent to a wall, with the end portions of said lowermost position back slat inserted within said diagonal slots and resting on said slot bases, and with the said support means for said back rails projecting into said opening and resting on and against said seat section head rail; or alternatively, on sliding said seat section on its skid means to provide space for the back section between the seat section and such wall, said back section may be supported horizontally with said support means of its left and right rails resting on such floor, for use of the combination as a bed.

4,692,953

PORTABLE COLLAPSIBLE BABY CRIB

G. David Fetters, 247 Schilling St., West Lafayette, Ind. 47906

Filed Jul. 11, 1986, Ser. No. 884,487
Int. Cl.[4] A47C *29/00*
U.S. Cl. 5—99 R **12 Claims**



1. A portable collapsible crib, comprising:

a rigid frame that is separable generally at the midpoints of a pair of opposing sides thereof into a first frame half and a second frame half;

rotatable hinging means, coupling said first and second frame halves at said midpoints, hingingly operable about first axes for foldably collapsing said first and second frame halves one upon the other at said midpoints, defining a frame collapsing position, and rotatably operable about a pair of second axes that are perpendicular to said first axes for rigidly supporting said first and second frame halves in inflexible planar alignment, defining a frame inflexible position;

leg means, mounted to and rotatable about said frame concurrently with said rotatable hinging means, for elevating said frame to a predetermined height when rotated about and disposed downwardly from said frame, said rotatable hinging means being concurrently rotated into said frame inflexible position, said leg means being further rotatable about said frame into the area bounded by said frame, said rotatable hinging means being concurrently rotated into said frame collapsing position; and

a collapsible crib structure mounted to and supported about

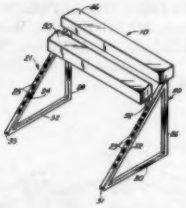
the perimeter of said frame and disposed downwardly therefrom, having rigid floor means removably attached to said leg means at predetermined points below said rigid frame when said leg means are rotated about and disposed downwardly from said frame, and operable to receive said rigid frame, said leg means and said collapsible crib structure within the area bounded by the perimeter of said floor means when said leg means are rotated about said frame into the area bounded by said frame, said rotatable hinge means being concurrently rotated into said frame collapsing position, said rigid floor means being further operable to fold about and enclose said first and second frame halves in said frame collapsing position and said collapsible crib structure, forming a valise structure thereabout.

4,692,954

LEGREST AND FOOTREST FOR BEDS

Eugene E. Scott, Sr., 4619 Longfellow Dr., New Orleans, La. 70127

Filed Sep. 2, 1986, Ser. No. 902,579
Int. Cl.[4] A47C *20/02*
U.S. Cl. 5—443 **1 Claim**



1. A portable leg and foot rest for beds, comprising:

(a) a pair of triangular support means each having an elongated base member having a channel provided therealong in its underside for slidably engaging the side railings of a bed, a vertical member and an angular member having spaced apart apertures therealong;

(b) a crossbar of a length substantially equal to the distance between said side railings of said bed, each end thereof being fixedly connected to one of said triangular support means at approximately the point where said angular member and said vertical member are joined together, whereby said triangular support means are substantially parallel to each other and substantially perpendicular to said crossbar;

(c) plurality of support bars fixedly connected to said crossbar and being substantially perpendicular to said crossbar and substantially parallel to said base members;

(d) an elongated footrest member of approximately the same length as said crossbar and fixedly mounted on said support bars, said footrest member having an elongated cushion with a solid core member and padding thereon;

(e) a legrest member of approximately the same length as said crossbar and having an elongated cushion with a solid core member and padding, each end of said solid core member fixedly attached to a brace with projections depending downwardly therefrom for selectively and adjustably engaging said spaced apart apertures of said angular support members; and,

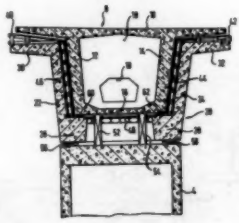
(f) means for removably fastening said base members to said side railings of said bed.

4,692,955

METHOD FOR ERECTING A BRIDGE SUPERSTRUCTURE OF PRESTRESSED CONCRETE AND LAUNCHING GIRDER FOR PERFORMING THE SAME

Horst Kinkel, Mozartweg 34, 6100 Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 635,798, Jul. 30, 1984, Pat. No. 4,660,243. This application Jul. 14, 1986, Ser. No. 885,411
Claims priority, application European Pat. Off., Aug. 11, 1983, 83107978.5
The portion of the term of this patent subsequent to Apr. 28, 2004, has been disclaimed.
Int. Cl.[4] E04C *3/02*; E01D *1/00*
U.S. Cl. 14—17 **3 Claims**



1. A method for the segmented erection of a prestressed concrete superstructure of a bridge having a plurality of bridge supports positioned beneath and adapted to support the superstructure, the method comprising the steps of (a) providing a launching girder having formwork thereon for forming segments of the superstructure, (b) supporting said girder in a concreting position on at least one of said bridge supports, (c) concreting and stressing a superstructure segment utilizing the formwork on said girder, (d) providing bearing means between a previously formed superstructure segment and said girder for supporting said superstrcture onusaid girder as the girder is moved, (e) providing bearing means between said girder and said one bridge support permitting movement of said girder with respect to said bridge support, and (f) launching said girder to another concreting position.

3. Apparatus for the segmental erection of a prestressed concrete superstructure of a bridge having a plurality of bridge supports positioned beneath and adapted to support the superstructure, comprising a launching girder having formwork thereon for forming segments of the superstructure, said girder being adapted to rest on at least one of said bridge supports in concreting position to form a superstructure segment, first bearing means positionable between a previously formed superstructure segment and said girder for supporting said superstructure segment on said girder for permitting movement of said girder relative said superstructure segment, and second bearing means positionable between said girder and said one bridge support for permitting movement of said girder relative said bridge support, said girder possessing sufficient compressive strength to carry the weight of previously formed superstructure segments through said first bearing means as the girder is moved to another concreting position.

4,692,956

POOL VACUUM

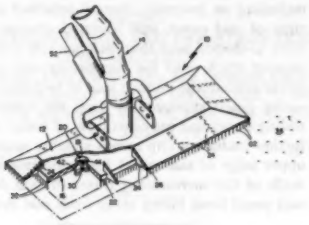
Amin I. Kassis, 57 Stockdale Rd., Needham, Mass. 02192

Filed Dec. 31, 1985, Ser. No. 815,214
Int. Cl.[4] E04H *3/20*
U.S. Cl. 15—1.7 **12 Claims**

1. A device for removing foreign matter from a water-filled pool, comprising:

a vacuum head having a chamber-defining housing, and a conduit communicating with said housing, said conduit being connectable to a suction means;

a plurality of agitator members comprising an elongated blade rotatably attached to an axial shaft and having fluid deflecting surfaces pitched with respect to said shaft axis, said agitataor members being rotatably connected to the inside of said housing in position above the pool surface to be rotated by fluid suctioned from said housing into said conduit, rotation of said agitator members causing turbulence to dislodge fine particulate matter from a pool surface,



a partition member positioned within said housing to define inner and outer chamber portions,

a plurality of support means supporting said partition member from said housing; and

a plurality of ports in said partition member communicating suction between said inner and outer chamber portions, each said agitator member being positioned within a said port.

4,692,957

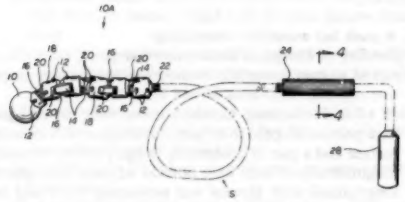
BEND FOLLOWING PLUMBERS SNAKE

Julius S. Kovacs, 40 Canterberry Rd., Bridgeport, Conn. 06608

Filed Mar. 13, 1986, Ser. No. 839,204

Int. Cl.[4] B08B *9/02*

U.S. Cl. 15—104.3 SN **4 Claims**



1. A plumber's snake comprising:

an elongated flexible member having a leading end and a trailing end,

means defining a jointed end portion at the leading end of said flexible member,

and a gripping means adjustably disposed along a trailing end of said member,

said gripping means comprising a sleeve mounted on said trailing end so as to slide relative thereto, and which, when squeezed, is frictionally secured in fixed relationship relative to said trailing end,

wherein said means defining said jointed end comprises:

a plurality of spaced apart links,

each of said links having opposed bifurcated end portions to define a slot thereat,

wherein said opposed end slots are disposed in out of phase relationship,

said links having its end slots disposed in phase relationship to the end slot of the next adjacent link,

a connector hingedly connecting the end of one link to the end of the next adjacent link,

and a weight member connected to the leading end of the leading link.

4,692,958

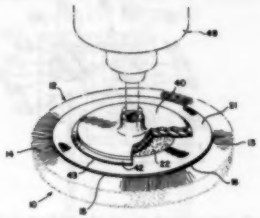
BUFFING PAD ASSEMBLY

Bruce L. McMakin, Hudson, Ohio, assignor to U.S. Chemical & Plastics, Inc., Canton, Ohio

Filed Jan. 8, 1986, Ser. No. 817,076

Int. Cl.[4] B24D *13/14*

U.S. Cl. 15—230.12 **23 Claims**



1. A buffing pad for use with a backing plate adapted to be driven by a power tool comprising:

a fabric pile for application against a work piece;

a backing side carrying said fabric pile;

loop means having a peripheral edge and carried centrally of said pad and against said backing side; and

cover means partially affixed to said backing side and enveloping said peripheral edge.

4,692,959

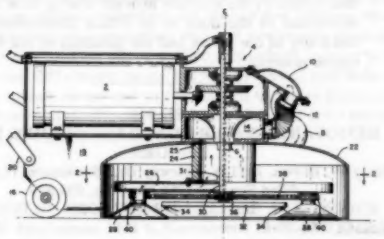
ROTARY CLEANER/SCRUBBER MECHANISM

Clifford L. Monson, 1765 Ala Moana Blvd., Honolulu, Hi. 96815

Filed Mar. 11, 1986, Ser. No. 838,386

Int. Cl.[4] A47L *11/20*

U.S. Cl. 15—320 **7 Claims**



1. A scrubbing head for use with a carpet cleaning machine or the like comprising:

a hollow vertical drive shaft adapted to be releasably secured to a driving means including a source of cleaning fluid, said drive shaft terminating at the lower end in a spray means for applying the cleaning fluid,

a rotatable, horizontally mounted plenum, removably secured to a vacuum source, said plenum mounted for free rotation upon said drive shaft and including a plurality of downwardly facing ports,

a vacuum nozzle rotatably secured to each port in fluid communication with the plenum, each of said nozzles including a drive means mounted thereon,

means interconnecting the drive shaft and each of said vacuum nozzle drive means whereby the vacuum nozzles

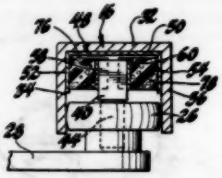
individually rotate while simultaneously moving with the plenum.

4,692,960

CHECK AND CONTROL FOR A SLIDING DOOR

Thadius F. Jozefczak, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 28, 1986, Ser. No. 901,394
Int. Cl.[4] E05D 15/00, 13/08
U.S. Cl. 16—86 A 4 Claims



3. In combination with a vehicle sliding door supported and guided by a channel shaped track mounted on the vehicle body and a roller mounted on the door and movable back and forth within the track to open and close the door, a door check and control mechanism comprising:

a follower member mounted on the door adjacent the roller and extending into the track beyond the roller and having a path of travel along the track during back and forth movement of the door,

first and second spring-like leaves mounted within the track at opposite sides of the path of travel of the follower member along the track, said leaves being spaced from the track at least along a portion of the length thereof and projecting into the path of travel of the follower member to interfere therewith so that the leaves are flexed and thereby impede the travel of the door along the track,

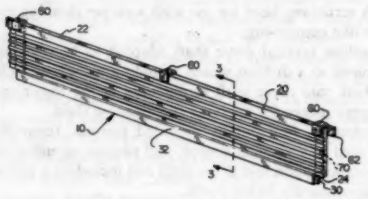
and first and second blocks of elastic material mounted respectively in the spaces between the track and the first and second leaves to yieldably support the leaves against said flexure by the follower member during back and forth movement of the door to an extent determined by the flexibility of the leaves and the elasticity of the blocks of elastic material.

4,692,961

REMOVABLE WATER GUARD FOR SLIDING PATIO DOORS

Jerry W. Brown, 2911 N. Fairway Dr., Burlington, N.C. 27215

Filed Sep. 22, 1986, Ser. No. 909,690
Int. Cl.[4] E06B 3/32, 7/26
U.S. Cl. 16—95 R 6 Claims



1. A water guard for removable attachment to the floor track of a pair of sliding glass doors where the track is formed of at least two opposed sidewalls between which the doors slide, one of said track walls being in the interior room environment and the opposed said wall being in the exterior environment; said water guard including:

(a) a substantially flat, elongated panel having a prescribed height and a width approximately equivalent to that of said doors, upper and lower edges, front and rear faces, and including means for removably attaching said panel in vertical relationship to the room floor, to said interior sidewall of said door track such that said panel rear face lies closely adjacent the interior face of said doors;

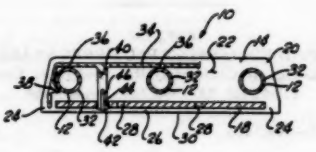
(b) said means for attaching said panel to said track wall including an inverted channel attached along the lower edge of said panel; said inverted channel being substantially U-shaped such that the open side is slipped over said interior track wall for supporting said panel along the lower edge of the interior face of said doors; whereby said water guard substantially seals the lower edges of said sliding doors and prevents flow of water underneath; and further including clip means slidably mounted along said upper edge of said panel for engagement with the sidewalls of the surrounding frame of said doors to prevent said panel from tilting away from said doors.

4,692,962

CONCEALED MOUNTED PUSH BARS AND GRILLS

Sam Avny, 44 Holmes Pl., Fredonia, N.Y. 14063

Continuation of Ser. No. 629,888, Jul. 11, 1984, abandoned. This application Jan. 21, 1986, Ser. No. 821,116
Int. Cl.[4] A47H 33/00
U.S. Cl. 16—111 R 8 Claims



1. A push bar assembly comprising:

a plurality of elongated coextensive bars;

a pair of unitary mounting members which receive respective opposite axial ends of said bars;

each of said mounting members comprising an elongated base portion adapted to be positioned adjacent a mounting surface and a pair of upstanding flange portions extending longitudinally of said base portion adjacent the opposite longitudinal sides thereof and projecting from said base portion to form therebetween a frontally open elongated recess with said base portion forming a bottom portion of said recess;

plural aperture means formed in one of said flange portions of each said mounting member; each said aperture means receiving a respective axial end of one of said bars in a manner to secure said bars in fixed spaced relationship; the other of said flange portions of each said mounting member forming abutment means for abutting engagement with the respective axial ends of said bars in a manner to secure said bars in fixed longitudinal relationship with the longitudinal ends thereof extending transversely of said recess;

fastener receiving aperture means formed in the respective base portions of said mounting members intermediate the respective said flanges and oriented to receive axially therein via said frontally open recess mounting fasteners for securing said mounting members to such a mounting surface in fixed, spaced relationship to thereby captively retain said bars;

a formed cap means which is cooperable with each said mounting member to cover said frontally open recess and

thereby conceal said axial ends of said bars and the mounting fasteners;

each said cap means includes a retention means which cooperates with at least some of said bars to retain said cap means with respect to the respective said mounting member; and wherein said retention means includes tab means located to interlock under said at least some of said bars intermediate said flanges for biased releasable retention of said cap means with respect to said mounting member.

4,692,963

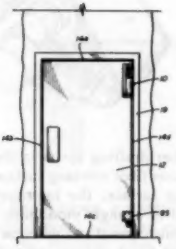
SELF-CLOSING HINGE AND ISOLATION DOOR INSTALLATION

Louis F. Barroero, 1585 Daniels Dr., San Leandro, Calif. 94577

Continuation-in-part of Ser. No. 689,337, Jan. 7, 1985, abandoned. This application Jun. 16, 1986, Ser. No. 874,507

Int. Cl.[4] E05F *1/14*

U.S. Cl. 16—275 **10 Claims**



1. In a self-closing isolation door installation, the combination comprising:

(a) a door adapted for mounting within a door frame and adapted to swing between a closed and an opened position;

(b) resilient gasket means connected about the periphery of said door to insure a tight seal in open spaces about said door;

(c) a first hinge means vertically mounted with the side edge of said door and adapted for mounting to the side of a vertical member of said door frame;

(d) a second self-closing hinge means including a vertically disposed, elongated C-shaped bracket slidably mounted into said side edge of said door;

(e) said bracket including vertical strut, an upper arm, and a lower arm;

(f) a support shaft mounted in fixed relation between said upper arm and said lower arm to complete a structure which is generally rectangular in shape;

(g) a housing bracket mounted in pivotable relation around said shaft and closely adjacent to said upper arm to vertically support said upper arm and adapted for mounting to said vertical side of said door frame and thereby to support said door from said door frame as appropriate;

(h) said housing bracket defining an inverted V-shaped cam surface extending radially around said shaft with the apex of said V-shape being oriented with said door when said door is in said closed position;

(i) a cam follower body including a follower arm carrying a radially spaced apart inner follower roller and outer follower roller, (1) said follower body being mounted in pivotable relation around said shaft with said outer roller engaged for vertical movement within said slot, and (2) said inner roller being engageable to follow said cam surface responsive to relative rotation between said door and said housing bracket; and

(j) resilient compression spring means mounted around said shaft and biasing said follower body to forcefully bias said inner follower roller against said V-shaped cam surface; a rotary bearing mounted on said shaft between said upper arm and said housing bracket and adapted to support the entire weight of said door; said vertical strut, said upper arm and said lower arm are formed with a linear outwardly facing U-shape slidably fitting over the sides of the door and against the side edge of said door.

4,692,964

CONCEALED SELF-CLOSING HINGE

William DeBruyn, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Mar. 5, 1986, Ser. No. 836,248

Int. Cl.[4] E05D *3/10*

U.S. Cl. 16—367 **12 Claims**

1. Hinge means for supporting a door to swing in an arc relative to a frame about a predetermined hinge axis between a fully closed position and a fully open position, said hinge means comprising first and second members adapted to be secured rigidly to said door and frame, respectively, first and second links each having first and second end portions, means pivotally connecting the first end portion of said first link to said first member and supporting said first link to swing relative to said first member about a first axis which intersects said hinge axis at a predetermined point, means pivotally connecting the first end portion of said second link to said second member and supporting said second link to swing relative to said second member about a second axis which intersects said hinge axis at said point, means connecting the second end portions of said links together and supporting said end portions to pivot relative to one another about a third axis which intersects said point, and self-closing means carried by one of said links and acting against the second end portion of the other link to urge said door to said fully closed position after said door has been swung part way from said fully open position.

4,692,965

SHRIMP PROCESSING METHOD AND DEVICE

Fred W. Stephenson, 1131 E. Commercial Blvd., Ft. Lauderdale, Fla. 33334

Continuation-in-part of Ser. No. 715,669, Mar. 25, 1985, abandoned. This application Sep. 29, 1986, Ser. No. 912,988

Int. Cl.[4] A22E *29/02*

U.S. Cl. 17—48 **18 Claims**

4. A method for processing shrimp comprising the steps of:

singulating the shrimp to pass ins ingle file by passing the same substantially horizontally through an opening which will pass only one shrimp at a time,

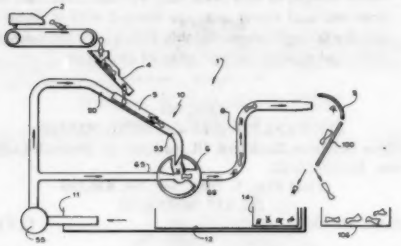
orienting the singulated shrimp to be positioned in a tail-down direction by means of dropping the shrimp one at a time onto a diverging sloped slot,

passing the thus-oriented shrimp into a vertical stream of fluid,

impinging a horizontal faster stream of fluid on the subject shrimp adjacent a fulcrum,

severing the head from the tail fo the shrimp at the fulcrum

by impacting the same with fluid travelling at a greater rate than the shrimp is fed to the fulcrum,



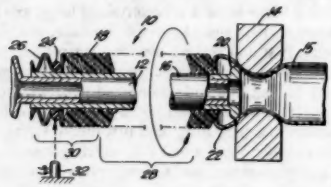
thereafter shaping the flow with a relieved lower recess to direct the tail upwardly,
and thereafter separating the heads and tails.

4,692,966

ARTICLE, METHOD FOR CONTROLLING CASING DEPLETION

Joseph A. Nausedas, Oak Forest, Ill., assignor to Viskase Corporation, Chicago, Ill.

Division of Ser. No. 481,034, Mar. 31, 1983, Pat. No. 4,606,379.
This application Aug. 8, 1986, Ser. No. 895,005
Int. Cl.[4] A22C *11/02*
U.S. Cl. 17—49 **6 Claims**



1. A method of terminating a casing stuffing operation prior to the exhaustion of a casing supply, said method comprising the steps of:

(a) providing a casing article including a hollow substantially rigid, tubular core and a shirred strand of casing on said core, said strand having a fore end from which casing is first to deshirr and a rear portion which contains the trailing end of said strand and which is last to deshirr, said casing and core being in sufficient contact over the length of said strand to provide a resistance to relative forward movement between said strand and core responsive to the deshirring of casing from said strand, the magnitude of said resistance decreasing as casing is deshirred and the length of said strand decreases;

(b) mounting said casing article to a stuffing apparatus such that the product being stuffed will pass through said hollow tubular core;

(c) stuffing the product through said tubular core and into casing which deshirrs from the fore end of said strand and continuing said stuffing until the supply of casing contained in said strand is deshirred and exhausted back to said rear portion;

(d) during said stuffing step (c), restraining said rear portion and the trailing end of said strand against forward movement along said core by engaging said rear portion against a projection provided on the outer peripheral surface of said tubular core;

(e) continuing said stuffing by deshirring casing from said rear portion adjacent said projection and allowing the deshirring of casing to pull the remaining rear portion of shirred casing towards, but not beyond, said projection;

(f) detecting the longitudinal movement of said trailing end as the rear portion is pulled towards said projection; and

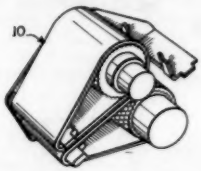
(g) initiating the termination of said stuffing step responsive to the longitudinal movement of said trailing end.

4,692,967

TEXTILE FIBER DRAFTING APRON AND METHOD

John J. Dolan, Blairgowrie, and Charles Dye, Dundee, both of Scotland, assignors to Day International Corporation, Dayton, Ohio

Filed May 25, 1982, Ser. No. 381,667
Int. Cl.[4] B29C *25/00*
U.S. Cl. 19—244 **4 Claims**



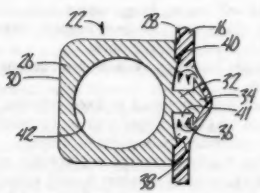
1. In a textile fiber drafting apron in the form of a flexible sleeve having an outer fiber working surface and an inner work member contacting surface, the improvement wherein said apron is comprised of a single monolithic layer of polymeric material free of reinforcement and wherein said outer surface is smooth and unground and provides an acceptable fiber working surface.

4,692,968

METHOD AND MEANS FOR SECURING PLASTIC COVERED EQUIPMENT TO A SUPPORT SURFACE

Leon E. Girard, Ames, Iowa, assignor to Iowa State University Research Foundation Inc., Ames, Iowa

Filed Sep. 16, 1985, Ser. No. 776,304
Int. Cl.[4] A43C *7/00*
U.S. Cl. 24—145 **2 Claims**



1. A coupling device to be embedded in plastic material for attachment to a locking means, comprising:

a body member having first and second ends, and a central axis;

a stub shaft secured to said first end of said body member and extending outwardly therefrom on said central axis;

a pointed probe head secured to the outer end of said stub shaft, and having an inner face parallel to a portion of said first end of said body member, and with a diameter greater than the diameter and greater than the length of said stub shaft;

a concave surface on said first end and surrounding said stub shaft and terminating in an arcuate annular shoulder on said first end, said annular shoulder having a diameter greater than that of said inner face of said probe head and creating an annular space with respect to said inner face of

said probe head, said portion of said first end surrounding said annular shoulder and recessed relative to said annular shoulder, whereby, when said probe head is heated and forcibly embedded into a plastic material, the plastic material will melt and will be induced to flow around said probe head into engagement with said concave surface and thence into said annular space to completely embed said probe head, said stub shaft and said annular shoulder with such melted plastic material; and

means on said body member for attachment to a locking means.

4,692,969

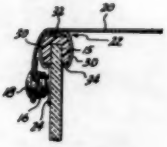
WINDSHIELD ATTACHMENT CLIP

Roy S. Johnson, P.O. Box 2662, Lynnwood, Wash. 98036

Filed Aug. 28, 1986, Ser. No. 901,515

Int. Cl.[4] A44B *21/00*

U.S. Cl. 24—573 **7 Claims**



1. An attachment for securing a releasable snap fastener component at a selected point along an exposed edge of a windshield, wherein the exposed edge of the windshield carries trim substantially covering that edge, the attachment comprising:

(a) a clip portion comprising a strip of elastic material formed into a generally U-shaped configuration to thereby define two legs extending from a base, the base being bowed inwardly, and the legs being outwardly bowed to fit over and substantially cover the trim at the selected point along the windshield edge, and to be slidably adjustable thereon, with the legs of the clip portion clasping the trim; and

(b) a substantially flat extension piece integrally formed with the extending from one of the legs, and releasable snap fastener component being attached to the extension piece.

4,692,970

BELT BUCKLE WITH EJECT MEANS

James R. Anthony, Carmel, and Michael A. Wiseman, Whiteland, both of Ind., assignors to Indiana Mills & Manufacturing, Inc., Carmel, Ind.

Continuation-in-part of Ser. No. 762,451, Aug. 5, 1985, Pat. No. 4,617,705

This application Oct. 17, 1986, Ser. No. 920,285

Int. Cl.[4] A44B *11/26*

U.S. Cl. 24—642 **20 Claims**

1. A buckle comprising:

a reinforcement plate having a longitudinal axis extending through a longitudinal plane and further having legs with distal ends;

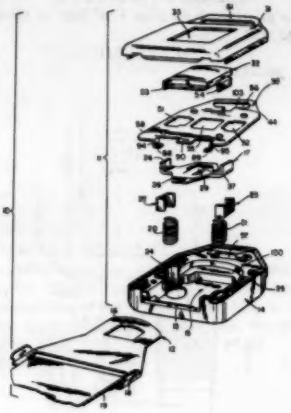
a main body having said plate mounted thereto and including stop surfaces receiving said distal ends and limiting relative movement between said plate and main body, said main body includes yieldable means integral therewith for engaging said plate, said yieldable means being moveable to allow said plate to be inserted in said main body and then moveable back holding said plate therein;

a latch positioned in said main body and held captive therein by said plate, said latch moveable between a latch position and an unlatched position;

spring means contacting said latch to move said latch back and forth between said latch position and said unlatched position;

operator means operable to move said latch to said unlatched position;

a cover mounted to said main body and cooperatively forming a mouth therewith, said plate extending adjacent said mouth with said cover enclosing said latch, said spring means and said plate, said cover including securing means



extending between said plate and said main body securing said cover to said main body; and,

limit means depending from said plate within said main body and spaced apart aft of said mouth and including tongue stop surfaces to limit movement of said tongue when said tongue is in said buckle.

4,692,971

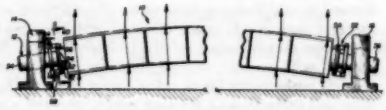
TENSION COMPENSATING WEB EXPANDER ROLLER

James F. Ginter, Jupiter, Fla., assignor to Spencer-Johnson Company, Appleton, Wis.

Filed Oct. 30, 1986, Ser. No. 924,765

Int. Cl.[4] D06C *3/06*

U.S. Cl. 26—103 **8 Claims**



1. A compensating roll for flexible sheet or web material including a curved axle having opposite ends that are supported by a pair or spaced-apart support assemblies, a series of annular spool assemblies rotatably mounted in axially end-to-end relation on said axle, and a series of annular sleeve sections received over said spools, axle adjusting means for adjusting said curved axle such that the axis thereof may be set in any desired plane about a straight axis common to both of said support assemblies, the improvement comprising,

a curved axle having a center section and an adjustable end section on each of the opposite ends thereof;

each of said adjustable end sections comprising a shaft coupled to said center section, a hollow cylindrical tube disposed about said shaft, means on said shaft for pivotally supporting one end of said tube, and means on said shaft for adjustably supporting the other end of said tube to adjust said other end with respect to said shaft through the plane of said curved axis of said axle.

4,692,972

DEVICE FOR THE LINING OF SLOTS OF STATOR OR ROTOR LAMINATION PACKS FOR ELECTRICAL MACHINES WITH SLOT LINERS

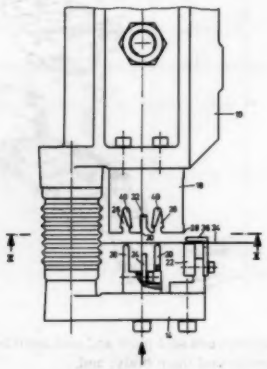
Otto Schultes, Staudt, Fed. Rep. of Germany, assignor to Statomat-Globe Maschinenfabrik GmbH, Niederdorfelden, Fed. Rep. of Germany

Filed Aug. 19, 1985, Ser. No. 766,926

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1984, 3432038

Int. Cl.[4] B21D *39/03*

U.S. Cl. 29—33 L **7 Claims**



1. An apparatus for simultaneously lining a plurality of radially oriented slots of a stator or rotor lamination pack for a dynamoelectric machine with slot liners, the apparatus comprising;

a matrix having at least two parallel forming slots therein;

a die plate relatively movable arranged with respect to said matrix and including at least two forming dies;

a cutting plate operatively associated with said die plate and located between said at least two dies, said cutting plate having a cutting edge;

forming means having a beveled surface therein, said forming means adapted to be arranged between said matrix and a stator or rotor lamination pack, said forming means causing predetemined sides of respective slot liners formed in said forming slots to be aligned flush with respective slots in said stator or rotor lamination pack; and

an insertion punch means relatively laterally movably arranged with respect to said forming dies for simultaneously pushing slot liners out of said at least two forming slots and through said forming means, thereby inserting said slot liners into the slots of said stator or rotor lamination pack.

4,692,973

DRILLING AND MOUNTING MACHINE FOR FURNITURE PRODUCTION

Dietmar Blum, Höchst, Austria, assignor to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Jul. 26, 1985, Ser. No. 759,285

Claims priority, application Austria, Aug. 27, 1984, 2726/84

The portion of the term of this patent subsequent to Sep. 30, 2003, has been disclaimed.

Int. Cl.[4] B23P *23/04, 19/04*

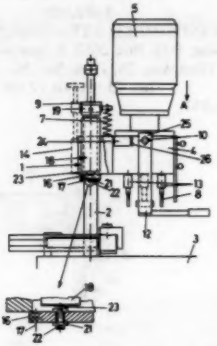
U.S. Cl. 29—33 K **6 Claims**

1. A drilling and mounting machine, alternatively operable either manually or by fluid pressure, for drilling fastening holes for furniture fittings, for example hinges, in furniture parts, and for mounting the furniture fittings in the thus drilled furniture parts, said machine comprising:

a frame;

a housing supporting a drilling mechanism including a gear block for a plurality of drill spindles and a driving motor, said housing being mounted for movement with respect to said frame;

an inserting member pivotally mounted on said housing for movement between a withdrawn position, whereat movement of said housing relative to said frame enables a drilling operation, and an inserting position, whereat movement of said housing relative to said frame enables a furniture fitting insertion operation;



manually operable feed means for moving said housing relative to said frame and comprising a lever mechanism connected to said frame and to said housing, whereby manual operation of said lever mechanism moves said housing with respect to said frame; and

fluid operated feed means, operable alternatively to said manually operable feed means, for moving said housing relative to said frame, said fluid operated feed means comprising a fluid operated piston-cylinder unit having a first portion mounted on said frame, a fastening plate mounted on said housing, and means connecting a second portion of said piston-cylinder unit to said mounting plate.

4,692,974

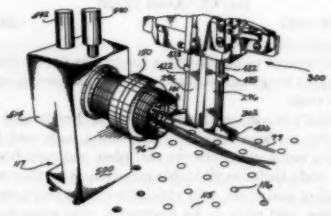
CONNECTOR BLOCK FOR USE WITH A ROBOTIC WIRE HARNESS ASSEMBLY SYSTEM

Dan A. Cross, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 741,318, Jun. 4, 1985. This application Nov. 18, 1985, Ser. No. 798,828

Int. Cl.[4] H01R *43/00*

U.S. Cl. 29—33 M **18 Claims**



2. A connector block for precisely positioning a connector in any one of a plurality of clocking positions relative to a work surface, comprising:

(a) a base positionable on the work surface;

(b) a socket for receiving the connector, the socket being

connectable to the base in any one of a plurality of clocking positions;

(c) means for securing the socket in the selected position and,

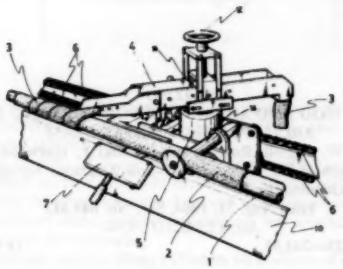
(d) means for indicating to a robot the selected clocking position and the position of the base relative to the work surface.

4,692,975

PAINT ROLLER

Jaime A. Garcia, Ronda Santa Maria 3-7 Barbera Del Valles, Barcelona, Spain

Filed Dec. 11, 1985, Ser. No. 807,818
Claims priority, application Spain, Jan. 11, 1985, 283921
Int. Cl.[4] B05C *17/02*
U.S. Cl. 29—120 3 Claims



1. In a paint roller including a tubular core and a fabric cover on said core, the improvement comprising:

the tubular core comprising a thermoplastic material; and

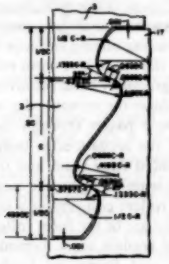
the fabric cover being heat fused to the surface of the core by heat softening said thermoplastic material without an intermediate adhesive.

4,692,976

METHOD OF MAKING SCALABLE SIDE ENTRY TURBINE BLADE ROOTS

Robert P. Andrews, San Jose, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 760,387, Jul. 30, 1985, abandoned. This application Jun. 11, 1986, Ser. No. 872,987
Int. Cl.[4] B21K *3/04*
U.S. Cl. 29—156.8 B 4 Claims



1. A method of making turbine blade roots, steeples and grooves so that stress concentrations in each blade root and steeple are equal, comprising the steps of:

forming the blade roots, grooves, and steeples so that they have matching shapes;

forming the blade roots and steeples to have inclined surfaces which abut, providing contact areas between the blade roots and steeples, these inclined surfaces being the only contact areas between the blade roots and steeples;

providing a proportional dimensional model of a blade groove root and steeple wherein any size blade root, steeple and groove can be scaled from said dimensional model by multiplying all dimensions on said model by a constant which is equal to a distance between a central portion of the inclined surfaces projected normal to a center line of the blade root; and

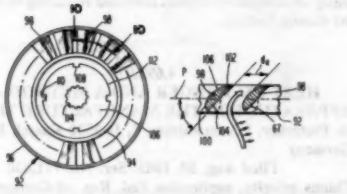
providing constant angle inclined contact surfaces on said model whereby any set of blade roots, grooves and steeples scaled from said model has equal stress concentration at all points of stress concentration within each blade root and steeple.

4,692,977

METHOD FOR CONVERTING A SPRAG-TYPE TORQUE CONVERTER INTO A SPRAGLESS TORQUE CONVERTER IN A POWER PLANT HAVING A COAXIAL IMPELLER AND TURBINE UNIT

Robert E. Maze, 3500 Cedar La., Drexel Hill, Pa. 19026

Division of Ser. No. 752,002, Jul. 5, 1985, Pat. No. 4,608,823, which is a continuation of Ser. No. 491,603, May 4, 1983, abandoned. This application Jun. 23, 1986, Ser. No. 877,538
Int. Cl.[4] B21K *3/04*; B23P *15/00, 17/04*
U.S. Cl. 29—156.8 R 3 Claims



1. A method for converting a sprag-type torque converter into a spragless torque converter comprising the steps of:

removing a stator member from between impeller and turbine members of the sprag-type torque converter, said stator member including fluid directing vanes between an inner and outer ring thereof, said vanes each having curved first and second surface, said stator having a sprag mounted in said inner ring, said sprag including a plurality of moving parts;

removing said sprag from within said inner ring;

grinding a surface of each of said vanes in a manner sufficient to cause said ground surface to be substantially flat;

inserting a stationary sprag billet in said inner ring, said billet having an aperture formed therethrough, said aperture being of a construction sufficient for maintaining said billet fixed on a stationary shaft, said billet being free of moving parts; and

mounting said spragless stator between said impeller and turbine.

4,692,978

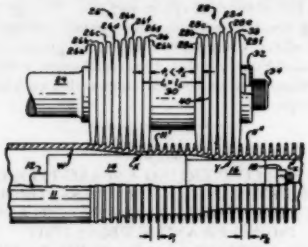
METHOD FOR MAKING HEAT EXCHANGE TUBES

James L. Cunningham, and Bonnie J. Campbell, both of Decatur, Ala., assignors to Wolverine Tube, Inc., Decatur, Ala.

Division of Ser. No. 520,265, Aug. 4, 1983. This application Jun. 24, 1985, Ser. No. 748,099
Int. Cl.[4] B21D *53/02*; B23D *15/26*
U.S. Cl. 29—157.3 A 3 Claims

1. A method of making a heat exchange tube from difficult to work materials such as titanium and stainless steel in a single finning pass comprising the steps of inserting a mandrel having at least a first larger diameter portion and a second smaller diameter portion inside a plain tube; moving the axes of a plurality of rotating disc carrying finning arobrs toward said

tube so that first and second sets of discs on said arbors, which are separated from each other by a spacer member, will sequentially force portions of said tube toward said first and second portions of said mandrel, said first set of discs serving to initially form the fins on said tube to at least approximately their final outside diameter and said second set of discs, whose



discs are axially spaced so as to have a greater pitch than the discs of the first set, serving to reduce the root diameter of the fins previously formed by the first set of discs without substantially changing the outer diameter of the fins formed by said first set of discs, said greater pitch of said second set of discs causing an elongation of said tube and reducing its tendency to twist during finning.

4,692,979

HEAT EXCHANGER AND A METHOD AND APPARATUS FOR THE MANUFACTURE THEREOF

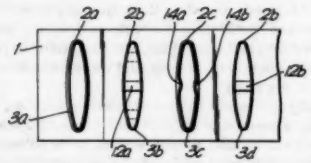
Dirk Pietzcker, Niederwaldstr. 5, D-3500 Kassel, Fed. Rep. of Germany

Filed Aug. 30, 1985, Ser. No. 771,630

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1984, 3432073

Int. Cl.[4] B21D *53/02*; **B23P** *15/26*

U.S. Cl. 29—157.3 C **10 Claims**



1. A method of attaching at least one fluid conducting metal tube to a plurality of heat dissipating metal fins, comprising the steps of: providing a plurality of heat dissipating fins; providing at least one oval or oblong shaped collar on each of said fins, said collars having openings having oval or oblong initial cross-sections through said fins; providing at least one metal tube having two ends and a generally oval or oblong outer cross section, said tube further having first similarly shaped wall portions at opposite ends of a major axis thereof and second similarly shaped wall portions at opposite ends of a minor axis thereof, and said tube having an outer cross-section slightly smaller than said initial cross-section of said openings; fitting said tube inside said openings of said fins; and attaching said tube to said fins by merely introducing an expansion means into one of said ends of said tube and moving said means through said tube to said other end thereof for progressively expanding said tube so as to progressively bring said first and second wall portions into contact with said collar and for further progressively expanding said tube and said collars to an extend such that said collars and said tube reach a condition in which said tube walls are stretched plastically to an outer cross-section slightly greater than said initial cross-section of said openings, and said collars are expanded elastically, further by providing at least one elongated spacer for supporting said second wall portions within said collars, said spacer substantially having a breadth corresponding to a distance between said second wall portions at a preselected location thereof and in the plastically stretched condition of said tube, and further by introducing said spacer into said tube at said preselected location and at said one end of said tube by moving said spacer directly with or behind said expansion means into said tube for preventing a shrinkback of said tube after plastical stretching thereof, and by terminating said process by leaving said spacer within said tube.

4,692,980

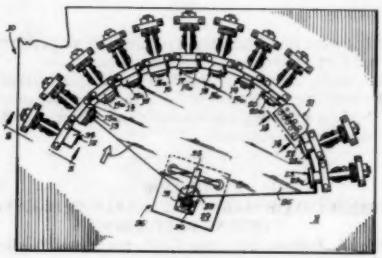
METHOD AND APPARATUS FOR FORMING AN ARCUATE SHEET METAL SEAM

Michael W. Carroll, Roselle, and Michael E. Harwood, Palatine, both of Ill., assignors to North American Agricultural, Inc., Schaumburg, Ill.

Filed Aug. 31, 1984, Ser. No. 646,612

Int. Cl.[4] B21D *39/04*

U.S. Cl. 29—243.52 **11 Claims**



1. An apparatus for forming an arcuate folded edge seam on an arcuate edge of flat workpiece of sheet metal comprising, in combination, a machine frame, a work holder on said machine frame mounted for turning movement relative to said machine frame, a plurality of form roller pairs mounted in said frame and arranged along an arc and about a predetermined axis, the rollers of each pair having mating surfaces that form a nip, the shape of the nips on the successive form roller pairs along the arc being such as to gradually bend the arcuate edge of the flat sheet metal piece to form the arcuate edge seam as the arcuate edge of the workpiece passes through the roller pairs; the length of the arc of the arcuate edge being greater than the length of arcuate folded edge seam and the excess in length causing waves in the seam, straightener means mounted in said frame adjacent said rollers comprising a converging passageway positioned on the arc of the form roller pairs for smoothing the waves in the arcuate seam formed in the workpiece; means mounted on said frame for feeding the workpiece through the form roller pairs and the straightener means; work hold down means for holding the workpiece on said work holder; and drive means mounted on said frame and connected to said means for feeding and effecting relative rotational movement of the workpiece relative to the former rollers and straightener means about said predetermined axis at the center of curvature of the arc defined by the form roller pairs and straightener means.

4,692,981

PROCESS FOR REPLACING BRIDGE BEARINGS

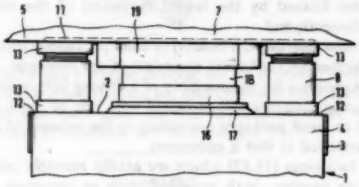
Helmut Homes, Uslar, Fed. Rep. of Germany, assignor to Glacier GmbH—Sollinger Hütte, Uslar, Fed. Rep. of Germany

Filed Dec. 20, 1985, Ser. No. 811,415

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3446721

Int. Cl.[4] B23P *6/00*

U.S. Cl. 29—402.08 8 Claims



1. A process for replacing bridge bearings between a bridge superstructure and supporting piers therefor, said process comprising the steps of:

removing parts of an existing bridge bearing from over a pier contact surface such that multiple mounting surfaces for lifting cylinders are created on said pier contact surface at a position under said superstructure; and around the remainder of the bearing

positioning multiple lifting cylinders on portions of said pier contact surface including said multiple mounting surfaces;

raising said bridge superstructure via said lifting cylinders;

removing additional parts of said existing bearing; and

introducing new bearing parts between said lifting cylinders.

4,692,982

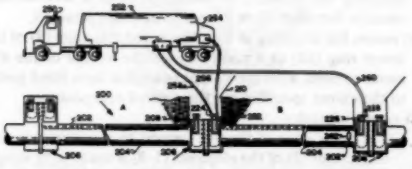
LINING REMOVAL PROCESS

Norman B. Rice, 2062 24th St., Cuyahoga Falls, Ohio 44223

Filed May 22, 1986, Ser. No. 865,757

Int. Cl.[4] F25D *1/00*

U.S. Cl. 29—402.09 40 Claims



1. A process for removing an adherent coating from a substrate comprising:

(a) placing said coating under elevated pressure;

(b) contacting said coating with a cryogenic liquid at a cryogenic temperature low enough to substantially weaken the cohesive forces which hold said coating together and the adhesive forces which bind said coating to said substrate while maintaining said coating under said elevated pressure, said elevated pressure being above the vapor pressure of said cryogenic liquid at said cryogenic temperature;

(c) shocking said coating so that it separates from said substrate, and

(d) withdrawing a stream of said cryogenic liquid containing particles of said coating entrained therein.

33. Apparatus for cryogenic treatment of a substrate having an adherent coating thereon in order to remove said coating, said apparatus comprising:

(a) a pressure vessel for receiving said substrate and said coating thereon;

(b) means for pressuring said pressure vessel;

(c) a cryogenic containment vessel for containing a cryogenic liquid under pressure;

(d) transfer line means for transferring said cryogenic liquid from said containment vessel to said pressure vessel;

(e) return line means for withdrawing cryogenic liquid containing suspended particles of coating from said pressure vessel and for returning cryogenic liquid to said containment vessel; and

(f) means in said return line for separating said particles of coating from said cryogenic liquid.

4,692,983

METHOD AND INSTALLATION FOR FITTING NUTS TO A WORKPIECE

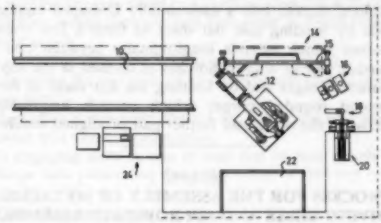
Osvald Kristola, and Paavo Korpela, both of Robertsfors, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Apr. 4, 1986, Ser. No. 848,291

Claims priority, application Sweden, Apr. 9, 1985, 8501734

Int. Cl.[4] B23P *11/00, 21/00, 19/00;* B23Q *15/00*

U.S. Cl. 29—432 8 Claims



1. A method for fitting nuts to a sheet-metal workpiece, by punching the nuts into the sheet metal, characterized by securing the workpiece in a stationary fixture; mounting a portable nut punching tool on a tool attachment provided on the wrist of an industrial robot for moving said punching tool from a tool storage location to said workpiece in said fixture; with the aid of the robot positioning the nut punching tool sequentially in pre-determined locations on the workpiece to which nuts are to be fitted and secured; and activating the nut punching tool for fitting a nut to the workpiece by punching the nut thereinto.

5. A robot installation for fitting nuts to a sheet-metal workpiece by punching the nuts thereinto, characterized in that the installation comprises a portable nut punching tool which can be detachably connected to a tool attachment provided on the wrist of an industrial robot said industrial robot having a wrist with a tool attachment thereon for moving said portable nut punching tool from a storage location to predetermined locations on the workpiece; and further comprises a stationary fixture for holding the workpiece during a nut punching operation.

4,692,984

METHOD OF FORMING HOUSING FOR FREE-STANDING CABINET

Thomas J. McKernan, Grand Rapids, and Brian Wilcockson, Holland, both of Mich., assignors to Haworth, Inc., Holland, Mich.

Division of Ser. No. 754,790, Jul. 12, 1985, abandoned. This application Oct. 14, 1986, Ser. No. 918,623

Int. Cl.[4] B23P *9/00*

U.S. Cl. 29—445 3 Claims

1. A method of forming a housing structure for an upright free-standing cabinet, comprising the steps of:

providing a planar and enlarged substantially rectangular sheet of thin metal;

forming four opposed pairs of notches in the top and edges of the sheet;

bending the upper and lower edges of said sheet to form inwardly projecting top and bottom flanges;

bending each side edge of said sheet substantially along one pair of said notches to form a rounded flange which extends longitudinally along said side edge;

positioning a first pair of elongated support rails on the inner surface of said sheet directly adjacent the rounded flanges, and welding said first support rails to said sheet;

positioning a second pair of elongated support rails adjacent the inner surface of said sheet so that the second support rails extend substantially parallel to but are spaced in-

wardly a substantial distance from said side edges, each of said second support rails being positioned in close proximity to a further pair of aligned notches as formed in the upper and lower flanges, and then welding said second rails to said sheet; and

forming said flat sheet with the first and second support rails welded thereto into a substantially U-shaped configuration by bending said flat sheet to form a first rounded corner which extends longitudinally between one said further pair of aligned notches as formed in the top and bottom flanges and by bending the flat sheet to form a second rounded corner which extends longitudinally between the other said further pair of aligned notches.

4,692,985

PROCESS FOR THE ASSEMBLY OF METALLIC DRIVING BELTS AND APPROPRIATE ASSEMBLY MOULD

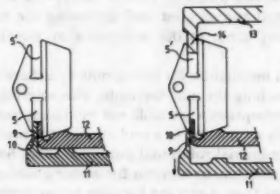
Johannes A. Van Dijk, Eindhoven, Netherlands, assignor to Van Doorne's Transmissie B.V., Tilburg, Netherlands

Filed May 28, 1986, Ser. No. 867,688

Claims priority, application Netherlands, May 28, 1985, 8501507

Int. Cl.[4] B23P *11/02, 19/02;* B23Q *7/10*

U.S. Cl. 29—450 **7 Claims**



1. A process for the assembly of a composite driving belt having a substantially trapezoidal cross-section and intended for use on V-shaped pulleys, consisting of an endless carrier in the shape of al least one metallic band and of a plurality of transverse elements which rest against one another with the parallel parts of their principal faces and which have been mounted slidably on the carrier, whilst lateral recesses have been provided for receiving the band(s), which elements have been bevelled radially inwards below the neutral line of the driving belt on at least one of their principal faces in order to permit bending of the driving belt, in such a fashion that the transverse elements are in contact with one another on the tilting line where the bevelled zone passes into the parallel zone of the principal face, whilst the transverse elements are provided with means of engagement in the form of at least one embossment on a principal face and a substantially corresponding cavity on the other principal face, characterized in

(a) mounting the elements with an embossment of each element engaging a cavity of each adjacent element and with their recess or one of the recesses on an (ancillary) annular assembly mould whose diameter exceeds that of the endless band or band package;

(b) mounting the ultimately required number of elements and make-up elements, respectively which are needed for the actual diameter of the endless band or band package;

(c) imparting to the aggregate of assembled elements a (smaller) diameter which corresponds with the one required to receive the band(s) or band package(s) into the slot formed by the lateral recess(es) of the transverse elements; and

(d) then inserting the band(s) or band package(s) into the slot formed by the lateral recess(es) of the elements.

3. Apparatus for the assembly of a driving belt composed of transverse elements and provided with one or more metallic bands or band packages according to the process of claim **1**, characterized in that it comprises

(a) two rings (**11,12**) which are axially movable relative to one another, both provided with an upturned annular raised rim edge (**9,10**), and which are to be placed such vis-à-vis one another that the inner diameter of the rim of one ring (**11**) which is in lower position (during assembly work) embraces the outer diameter of the rim of the other ring (**12**), the rim edges of the two rings together forming an upright assembly mould for the elements with a joint cross-section not exceeding the width of the lateral recesses (**5**) of the elements, whilst the outer diameter of the outer rim (**9**) exceeds the inner diameter of the band or band package to be inserted and the outer diameter of the inner rim (**10**) virtually coincides with that of the band(s) or band package(s) to be inserted;

(b) means (**13,14**) whereby the elements (**1–8**) to be mounted can be successively delivered to a point over the raised rim edges (the assembly mould **9,10**), whilst in a position in which the corresponding recesses (**5,5'**) of the elements to be mounted are perpendicular;

(c) an arm (**15**) enabling delivered elements to be moved along the upright assembly rim edges (**9,10**) up to a co-travelling arresting arm (**16**);

(d) means for measuring the distance between the element delivered first and the element delivered last and for terminating the delivery of elements when a well-defined distance between these elements has been attained;

(e) means for lowering at least the raised rim edge (**9**) of the lower ring (**11**) to a point beyond the profile of the elements present, after the vacant space has been filled partly to the extent specified for the desired end position;

(f) means whereby

(i) the outer edge of the slot formed by a continuous row or recesses (**5**) of the elements (**1–8**) is made to fit snugly against the outer edge of the inner rim (**10**); or

(ii) the elements (**1–8**) are joined together so as to rest against one another;

(g) means for inserting a band or band package into every slot formed by the continuous row of lateral recesses (**5,5'**) of the elements (**1–8**).

4,692,986

RAZOR CARTRIDGE WITH SHAVING AID

Vincent C. Motta, West Norwalk, and Frank A. Ferraro, Trumbull, both of Conn., assignors to Warner Lambert Company, Morris Plains, N.J.

Filed Sep. 27, 1985, Ser. No. 780,767

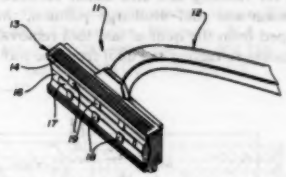
Int. Cl.[4] B23P *11/02*

U.S. Cl. 29—451 **5 Claims**

1. A method of attaching an, elongate shaving aid to a face-engaging surface of a razor cartridge comprising:

(a) creating a track in said face-engaging surface, said track including a flared inlet side with spaced restrictions cre-

ated by bulging spaced portions of said track therein, said track also formed with a stop opposite said inlet,



(b) forming said elongate shaving aid by extrusion molding then feeding said shaving aid insert into said track until the end of said insert abuts the stop opposite said inlet; and

(c) frictionally retaining said insert in said track.

4,692,987

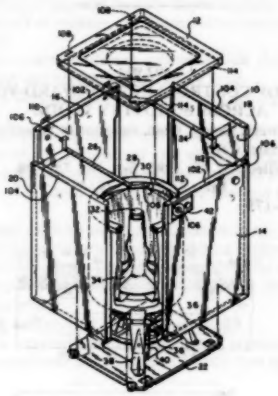
METHOD OF CONSTRUCTING A CABINET FOR AN AUTOMATIC WASHER

Victor W. Cuthbert, and Joel M. Snider, both of Lincoln Township, Berrien County, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 558,875, Dec. 7, 1983, Pat. No. 4,618,193. This application May 13, 1986, Ser. No. 862,710

Int. Cl.[4] B21D *39/00*; **B23P** *19/04*

U.S. Cl. 29—455 R **3 Claims**



1. A method of constructing a cabinet for a domestic appliance comprising the steps:

(1) positioning a base panel in a horizontal orientation,

(2) guiding a front panel toward the base panel at an angle from vertical,

(3) engaging slots in a bottom wall of the front panel with a first set of tabs protruding from the base panel,

(4) sliding the front panel laterally relative to the base panel until the tabs are captured by the bottom wall,

(5) rotating the front panel to a vertical orientation to engage a second set of tabs with openings in the front panel,

(6) repeating steps 2 to 5 for a rear panel,

(7) securing restraining bars to the top ends of the front, and rear panels,

(8) guiding a side panel toward the base panel at an angle from vertical,

(9) engaging slots in a bottom wall of the side panel with a third set of tabs protruding from the base panel,

(10) rotating the side panel to a vertical orientation to engage lock pins protruding from the front and rear panels with corresponding slots in the side panel,

(11) repeating steps 8 and 10 for a second side panel,

(12) securing the top ends of said side panels to said restraining bars,

(13) guiding a top panel toward the top of the rear panel at close to a vertical orientation,

(14) engaging slots in a rear wall of the top panel with hinge tabs protruding from the rear panel,

(15) rotating the top panel to a horizontal position over-lying the tops of the front, side and rear panels, and

(16) engaging a latch between the top panel and front panel to secure the two panels together.

3. A method of constructing a cabinet for a domestic appliance comprising the steps:

(1) positioning a base panel in a horizontal orientation,

(2) attaching a front panel along one side of the base panel,

(3) attaching a rear panel along an opposite side of the base panel,

(4) securing restraining bars between the top ends of the front and rear panels,

(5) guiding a side panel toward the base panel at an angle from vertical,

(6) engaging slots in one of said side or base panels with a set of tabs protruding from the other of said side or base panels,

(7) rotating the side panel to a vertical orientation to engage locking means between said side panel and said front and rear panels,

(8) repeating steps 5 to 7 for a second side panel,

(9) securing the top ends of said side panels to said restraining bars,

(10) guiding a top panel toward the top of the rear panel at close to a vertical orientation,

(11) engaging slots in one of said top or rear panels with hinge tabs protruding from the other of said top or rear panels,

(12) rotating the top panel to a horizontal position over-lying the tops of the front, side and rear panels, and

(13) engaging a latch between the top panel and at least one of said front or side panels to secure the panels together.

4,692,988

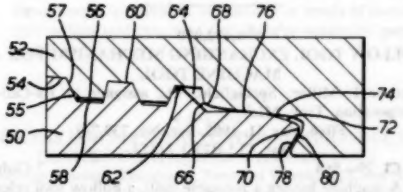
SCREW THREAD PROTECTION

Roderick L. Shulver; John Misselbrook, and Robert Standen, all of Great Yarmouth, England, assignors to Nowsco Well Service (U.K.) Limited, Norfolk, England

Filed Aug. 19, 1986, Ser. No. 897,804

Int. Cl.[4] B23P *25/00*; **F16L** *17/00*

U.S. Cl. 29—458 **34 Claims**



1. A method of protecting mating screw thread means including first and second screw threads and associated sealing surfaces at least under tightening torques, the method comprising the steps of

applying a dry film lubricant to the screw thread means,

applying a liquid lubricant to the screw thread means,

mating the screw thread means, and

tightening to the required torque value,

the liquid lubricant having substantially no solvent action on the dry film lubricant, good wetability and low viscosity and being non-volatile and non-chemically reactive, and

the method serving both to protect the mating threads and to

avoid any subsequent masking of any leakage path between the screw-threads.

4,692,989

PROCESS AND APPARATUS FOR PROFILING ROD-LIKE WORKPIECES

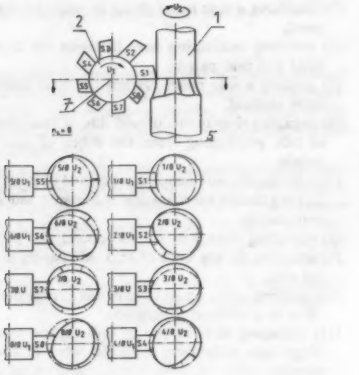
Walter Neubauer, Ohlsdorf, Austria, assignor to Linsinger Maschinenbau Gesellschaft mbH, Steyrermühl, Austria

Filed Jul. 1, 1986, Ser. No. 881,115

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1985, 3524123

Int. Cl.[4] B23P *13/00*; B23C *3/04*

U.S. Cl. 29—558 **15 Claims**



1. A process for radially profiling rod-like workpieces having at least one thread, comprising:

providing individual cutting edges arranged on a milling head with different radial positions and profiles and rotating said milling head about its axis;

providing a relative rotary motion of said rod-like workpiece effectively about its longitudinal axis with respect to said milling head to successively move the workpiece into a profile plane to produce the profile in accordance with the number of cutting edges on the milling head;

the profiling process being effected during one rotation about the axis of the milling head by superimposition therewith of said relative rotary motion about the axis of the workpiece.

4,692,990

HOLLOW TOOL EXCHANGING MECHANISM FOR A MACHINE TOOL

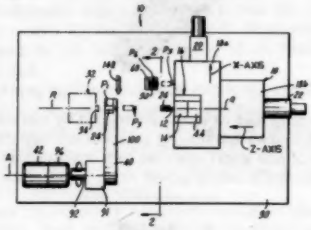
Lawrence I. Millay, Springfield, Vt., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed May 31, 1985, Ser. No. 739,741

Int. Cl.[4] B23Q *3/157*

U.S. Cl. 29—568 **7 Claims**

1. A machine having a rotatable quill, a hollow tool releasably held on the quill, slide means for carrying and positioning the quill, tool storage means for storing at least one hollow replacement tool, tool discharge means for receiving a worn hollow tool stripped from the quill, a tool removal arm means rotatable about a rotational axis between a tool removal position and tool discharge position adjacent the tool discharge means and having a tool enter station into which a worn tool on the quill is initially inserted by movement of the slide means and a tool strip station at which the worn tool is subsequently positioned, said tool enter station and tool strip station being spaced apart on the same circular arc relative to the rotational axis of the tool removal arm means and interconnected so that rotation of said arm means relative to said quill places the worn tool subsequently at said tool strip station, said tool strip station including tool trapping means fixed in position on the arm means for engaging the worn tool at the tool removal position, and means for rotating said arm means between the tool removal position and tool discharge position, the worn tool being stripped from the quill at said tool removal position by said slide means retracting the quill from the tool strip station



while the worn tool is held by said tool trapping means and being discharged into said tool discharge means by rotation of said arm carrying the worn tool to said discharge means, said slide means carrying the quill without a hollow tool thereon to said tool storage means for releasably securing the hollow replacement tool on the quill.

4,692,991

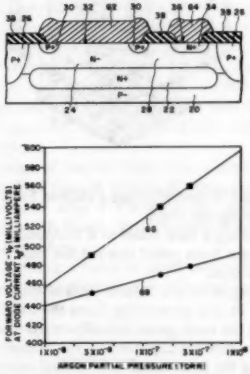
METHOD OF CONTROLLING FORWARD VOLTAGE ACROSS SCHOTTKY DIODE

Ronald C. Flowers, Sandy, Utah, assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Jul. 19, 1985, Ser. No. 757,038

Int. Cl.[4] H01L *29/48*

U.S. Cl. 437—175 **14 Claims**



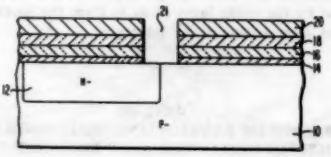
1. A method wherein a metallic layer is deposited on an N-type semiconductive region of a structure placed in a highly evacuated chamber to form a rectifying junction between a first portion of the N-type region and a segment of the metallic layer; and an electrical conductor is created to ohmically contact a second portion of the N-type region; characterized by the step of introducing at least one gas into the chamber during the deposition step in order to control the voltage V_F between the metallic segment and the conductor when the rectifying junction is forwardly conductive.

4,692,992

METHOD OF FORMING ISOLATION REGIONS IN A SEMICONDUCTOR DEVICE

Sheng T. Hsu, West Windsor Township, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 25, 1986, Ser. No. 878,259
Int. Cl.[4] H01L *21/425, 21/473*
U.S. Cl. 437—57 **13 Claims**



1. A method of making a semiconductor device comprising the steps of:

providing a semiconductor substrate with abutting regions of the same or opposite conductivity types, said regions extending to the surface of said substrate;

forming in at least one of said abutting regions a heavily doped region of the same conductivity type adjacent the interface with the other abutting region; and

forming a trench in said substrate by removing portions of said substrate, said trench having at least a wall portion extending along said heavily doped region.

2. A method of making a semiconductor device comprising the steps of:

providing a semiconductor substrate with abutting regions of a first and second conductivity type;

forming a first masking layer over said semiconductor substrate;

forming an opening in said first masking layer over at least a portion of the interface of said abutting regions;

forming a second masking layer on at least a portion of said region of a first conductivity type exposed by said opening;

introducing dopants of a second conductivity type through said opening to form a heavily doped region of a second conductivity type, a portion of said heavily doped region of a second conductivity type extending under said first masking layer;

removing said second masking layer; and

forming a trench in the regions of said semiconductor substrate which are not subtended by said first masking layer.

4,692,993

SCHOTTKY BARRIER CHARGE COUPLED DEVICE (CCD) MANUFACTURE

Marion D. Clark, 11725 Montana Ave., Los Angeles, Calif. 90049, and C. Lawrence Anderson, 4409 Henley Ct., Westlake Village, Calif. 91360

Division of Ser. No. 520,745, Aug. 5, 1983, abandoned, which is a continuation of Ser. No. 209,190, Nov. 17, 1980, abandoned, which is a continuation of Ser. No. 966,939, Dec. 5, 1978, abandoned. This application Oct. 4, 1985, Ser. No. 784,447
Int. Cl.[4] H01L *21/24, 29/56*
U.S. Cl. 437—53 **4 Claims**

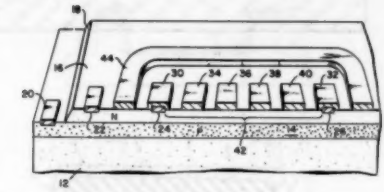
1. A process for fabricating a planar charge-coupled device structure which includes the steps of

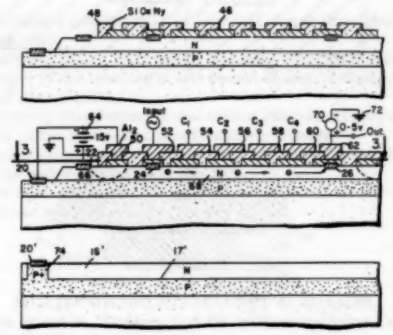
(a) providing a semiconductor body having an outermost channel region suitable for coupling charge between selected locations therein under the control of electrical signals,

(b) forming input, output, and bias ohmic contact electrodes at selected locations on said surface channel region and in a first level or plane above said semiconductor body,

(c) forming a plurality of selectively spaced charge transfer electrodes between said input and output ohmic contacts and having upper surfaces lying in a second level or plane above said semiconductor body, while simultaneously forming a charge isolation electrode surrounding said input, output and charge transfer electrodes and also lying in said second level or plane,

(d) forming an insulating mask atop said input, output, charge transfer and charge isolation electrodes and having openings therein aligned with said input, output, charge transfer and charge isolation electrodes, and





(e) depositing a plurality of cross-over or lead-in electrodes in said openings in said insulating mask and having surfaces lying in a third level or plane atop said semiconductor body, whereby said charge isolation electrode is formed simultaneously with the formation of said charge transfer electrodes to thereby enable close control over the spacing between said charge isolation electrode and other electrodes in the same level of metalization and simultaneously minimize the number of levels of metalization within said structure and thereby maximize process yields and device reliability.

4,692,994

PROCESS FOR MANUFACTURING SEMICONDUCTOR DEVICES CONTAINING MICROBRIDGES

Masahiro Moniwa, Kokubunji; Terunori Warabisako, and Hideo Sunami, both of Nishitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 29, 1986, Ser. No. 857,200
Int. Cl.[4] H01L *21/425*
U.S. Cl. 437—40 **10 Claims**

1. A process for manufacturing semiconductor devices comprising:

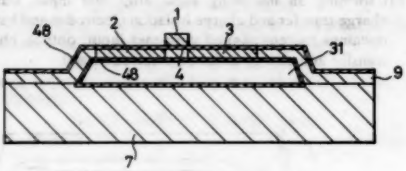
(i) a step for forming at least one first insulating film of a predetermined shape on a substrate;

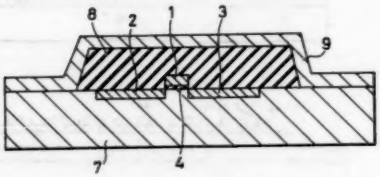
(ii) a step for forming a continuous semiconductor film on said substrate and said first insulating film;

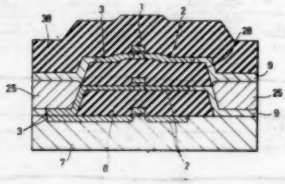
(iii) a step for forming at least one island region of a predetermined shape by a lithography, said island region being comprised of the continuous semiconductor film on said

substrate and on said first insulating film and said first insulating film under said semiconductor film;

(iv) a step for forming a microbridge which consists of said semiconductor film by removing said first insulating film







of said island region from at least the side of said semiconductor film; and

(v) a step for forming a second insulating film on the exposed surface of said microbridge.

4,692,995

METHOD OF OBTAINING A DIODE WHOSE CONTACT TAPPING IS SELF ALIGNED WITH A GATE

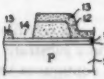
Pierre Blanchard, Echirolles, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 24, 1986, Ser. No. 822,028

Claims priority, application France, Jan. 25, 1985, 85 01085

Int. Cl.[4] H01L *21/225, 21/265*

U.S. Cl. 437—41 **6 Claims**



1. A method of obtaining a diode whose electrical contact is self-aligned with a gate, comprising the steps of depositing on a semiconductor substrate at least a first layer of dielectric material, depositing on the last dielectric layer a localized portion of a first layer of polycrystalline silicon for forming the gate, then a second polycrystalline silicon layer above the first layer, etching in the polycrystalline silicon layers essentially at the position desired for the diode until the dielectric layer is laid bare, oxidizing the substrate sufficiently to form an oxidized layer which completely covers the localized polycrystalline silicon layer and only partially covers the bared portion of the dielectric layer and doping the portion of the substrate not covered by the oxide layer so as to form the junction of the diode in such portion of the substrate.

4,692,996

METHOD OF FABRICATING SEMICONDUCTOR DEVICES IN DIELECTRICALLY ISOLATED SILICON ISLANDS

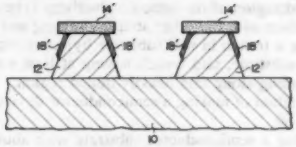
Yukio Minato, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

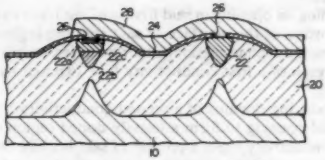
Filed Nov. 21, 1985, Ser. No. 800,257

Claims priority, application Japan, Nov. 21, 1984, 59-246605

Int. Cl.[4] H01L *21/306;* **C03C** *25/06*

U.S. Cl. 437—73 **5 Claims**





1. A method of fabricating a semiconductor device, comprising

(1) preparing a semiconductor substrate of a first conductivity,

(2) forming a semiconductor layer of a second conductivity type on the substrate,

(3) selectively removing the semiconductor layer to leave at least one protruding region gradually reduced in cross section away from said substrate and protruding from the surface of the substrate,

(4) forming oxidation resistive layers on the top surface and a portion of each of the side surfaces of said protruding region, the oxidation resistive layer on said top surface partially overhanging the top surface of said protruding region and the oxidation resistive layer on said portion of each side surface merging with the oxidation resistive layer on said top surface and terminating ahead of the exposed surface of the substrate to allow said semiconductor layer to be exposed adjacent the exposed surface of the substrate, and

(5) thermally oxidating exposed portions of said substrate and said protruding region to form a silicon oxide layer with at least one semiconductor device region formed within the silicon oxide layer, said semiconductor device region having a surface portion substantially flush with the surface of said silicon oxide layer.

4,692,997

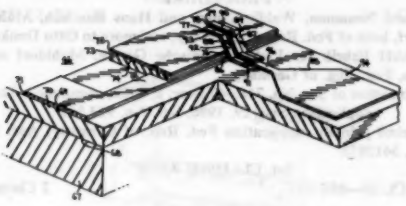
METHOD FOR FABRICATING MOMOM TUNNEL EMISSION TRANSISTOR

Joseph A. Calviello, Kings Park, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 683,705, Dec. 19, 1984, Pat. No. 4,630,081. This application May 15, 1986, Ser. No. 863,773

Int. Cl.[4] H01L *21/02*

U.S. Cl. 437—238 **2 Claims**



1. A method for making an MOMOM tunnel emission transistor comprising the steps of:

providing a substrate having a generally horizontal planar upper surface;

forming a first insulator layer on said upper surface of said substrate;

forming a first metal layer ranging in thickness from 100 to 1,000 angstroms on the upper surface of said first insulator layer;

forming a second insulator layer ranging in thickness from 1,000 to 10,000 angstroms on the upper surface of said first metal layer;

forming a second metal layer ranging in thickness from 50 to 500 angstroms on the upper surface of said second insulator layer;

defining a mesa having generally vertical sides exposing the edges of said layers;

oxidizing the exposed edge of said second metal layer to form a first oxide layer ranging in thickness from 5 to 20 angstroms;

forming a third metal layer extending along a portion of the upper surface of said first insulator layer adjacent said first metal layer and also extending along said side of said mesa;

oxidizing said third metal layer to form a second oxide layer ranging in thickness from 10 to 40 angstroms;

forming a fourth metal layer extending along said second oxide layer and including a portion on said insulator layer proximate said third metal layer and separated therefrom by said second oxide layer,

said second metal layer being one of the emitter and collector of said transistor, said fourth metal layer being the other of the emitter and collector of said transistor, said third metal layer being the base of said transistor.

4,692,998

PROCESS FOR FABRICATING SEMICONDUCTOR COMPONENTS

Albert L. Armstrong, Latham, N.Y., and Joel L. Goodrich, Westford, Mass., assignors to M/A-COM, Inc., Burlington, Mass.

Filed Jan. 12, 1985, Ser. No. 693,477

Int. Cl.[4] H01L *21/265*; B01J *17/00*

U.S. Cl. 437—225 **7 Claims**

1. A process for fabricating semiconductor devices comprising the steps of;

providing a semiconductor substrate in which will be defined an I-region separated by first and second channel defining areas,

disposing a layer of a dielectric material on said substrate including one and another segments thereof,

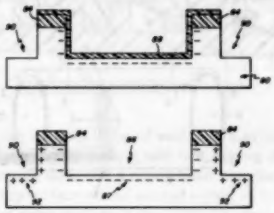
removing portions of said dielectric material in I-regions of the substrate,

disposing a second layer of a dielectric material over said substrate in said I-region,

removing at least said one segment of the first dielectric material in the first channel defining area of the substrate,

removing the substrate in said first channel defining area to define a first exposed substrate channel,

doping the exposed substrate in said first substrate channel with a first dopant,



disposing a protective layer over said doped first substrate channel,

removing at least said another segment of the first dielectric layer of the substrate in said second channel defining area of the substrate,

removing the substrate in said second channel defining area to define a second exposed substrate channel,

doping the exposed substrate in said second substrate channel with a second dopant,

and depositing a metallic layer in said first and second substrate channels.

4,692,999

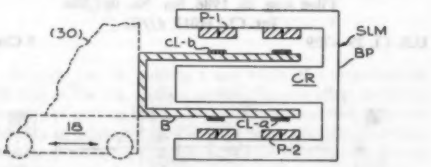
METHOD OF MAKING A MULTI-COIL/MULTI-MAGNET ACTUATOR

Jorgen Frandsen, Winnipeg, Canada, assignor to Unisys Corp., Detroit, Mich.

Division of Ser. No. 106,721, Dec. 26, 1979, Pat. No. 4,612,592. This application Jul. 25, 1986, Ser. No. 889,657

Int. Cl.[4] H02K *15/06*

U.S. Cl. 29—596 **11 Claims**



1. A method of making an improved electromagnetic actuator means including the steps of:

providing a bobbin structure arranged so as to be reciprocatable along a prescribed path;

disposing first and second magnet means along this path, these magnet means being arranged to include respective first and second magnetic pole means, arranged so the bobbin structure can pass operatively adjacent thereto as it proceeds along said path, past the pole means then presenting magnetic flux which is electromagnetically interactive with the bobbin structure; said pole means being opposite in magnetic polarity to one another;

and mounting first drive-coil means and second drive-coil means on said bobbin structure so as to magnetically interact with said flux from said first and second pole means and so generate a prescribed force driving said bobbin structure along said path.

4,693,000

METHOD FOR MANUFACTURING A THREE-DIMENSIONAL GRADIOMETER FOR A DEVICE FOR THE SINGLE OR MULTI-CHANNEL MEASUREMENT OF WEAK MAGNETIC FIELDS

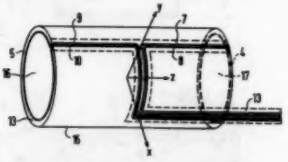
Eckhardt Hoenig, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 8, 1985, Ser. No. 796,595

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1984, 3442237

Int. Cl.[4] H01L *39/24*

U.S. Cl. 29—599 7 Claims



1. A method for manufacturing a gradiometer having a three-dimensional structure for a single or multichannel device for measuring magnetic fields with field intensities down to below 10^{-10} T and particularly below 10^{-12} T, comprising the steps of connecting superconducting coils of the gradiometer of predetermined dimensions lying in different planes to each other via superconducting connecting lines, and coupling said superconducting coils to at least one superconducting quantum interference element (SQUID), initially placing the gradiometer coils in spaced position with the connecting lines arranged therebetween on an at least largerly planar, flexible foil substrate body; forming the foil substrate body into the three-dimensional gradiometer structure and applying the foil substrate body with the gradiometer coils and connecting lines to a support body, the shape of which corresponds to the three-dimensional gradiometer.

4,693,001

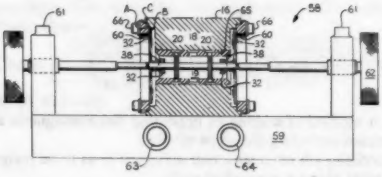
APPARATUS FOR AIR GAPPING THE ARMATURE IN A COMPOUND SPOOL VALVE

Charles A. Van Ornum, Fountain Valley, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Aug. 28, 1986, Ser. No. 901,306

Int. Cl.[4] H01F *41/00*

U.S. Cl. 29—759 5 Claims



1. An apparatus for positioning the spool in the valve body bore and setting the armature air gap with respect to the core assembly of a solenoid of a compound, spool type valve having a pressure inlet port and first and second cylinder ports, comprising:

means for supporting said valve body having first means for connecting a gas source with gas flow measuring means to said valve pressure inlet port and second means for interconnecting said valve first and second cylinder ports with a shunt;

means for displacing and locking said valve spool in said valve body while measuring gas flow at said flow measuring means when said first means is connected to a gas source; and

means for supporting said armature in spaced relationship to said valve body while slipped over said spool so as to set the air gap between said armature and said core assembly of said solenoid.

4,693,002

METHOD OF MANUFACTURING CONTACT SPRING PROCEDURE

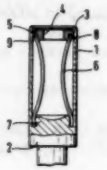
Gerhard Neumann, Waldkraiburg, and Hans Ramisch, Mühldorf, both of Fed. Rep. of Germany, assignors to Otto Dunkel GmbH Fabrik fur Elektrotechnische Gerate, Muhldorf am Inn, Fed. Rep. of Germany

Continuation of Ser. No. 718,447, Apr. 1, 1985, abandoned. This application Sep. 29, 1986, Ser. No. 913,566

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1984, 3412875

Int. Cl.[4] H01R *43/04*

U.S. Cl. 29—882 2 Claims



1. A method of manufacturing contact spring sockets, comprising the steps of:

providing a plurality of sections of straight contact springs from said contact spring wire;

providing a socket body having a generally cylindrical sidewall, a first, open end, a bottom, and an interior portion adapted to receive ends of said straight contact springs; including providing a generally disc-shaped central head projecting into said interior portion from said bottom of said socket body disposed generally co-axially within said sidewall body;

inserting said plurality of straight contact springs into said socket such that ends of said straight contact springs are received by said portion of said socket body adapted to receive said ends; said portion being a generally annular space between said central head and said sidewall;

aligning said straight contact springs parallel to one another within said socket body;

fixing said ends to said interior portion between said sidewall and said central head by deforming said central head;

providing a mandrel having an end and an annulus disposed generally concentrically about said end of said mandrel, said end of said mandrel having a diameter sufficiently small to permit entry into said first, open end of said socket body;

inserting said mandrel into said socket body at said first, open end thereof such that a co-axially annular gap exists between an inner wall of said socket body and said end of said mandrel;

moving said mandrel into said socket body until said annulus of said mandrel contracts free ends of said straight contact springs;

continuing movement of said mandrel toward said receiving portion of said socket body until said straight contact springs are deformed inwardly toward said cylindrical projection until a predetermined degree of curvature of said contact springs occurs;

withdrawing said mandrel while said annulus remains in fixed relationship to said socket body, such that said contact springs remain curved;

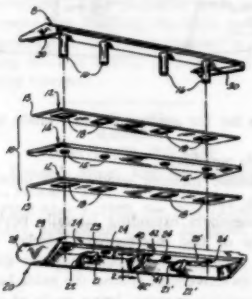
and deforming a portion of said socket body adjacent said annulus to fixedly retain annulus within said socket body.

4,693,003

PIVOTABLE RAZOR CARTRIDGE WITH CIRCULAR CAM

Frank A. Ferraro, Trumbull, Conn., assignor to Warner Lambert Company, Morris Plains, N.J.

Filed Sep. 15, 1986, Ser. No. 908,079
Int. Cl.[4] B26B *21/00*
U.S. Cl. 30—50 **3 Claims**



1. A cartridge for a pivoting head razor said razor including a razor handle, said razor handle including means for pivotally attaching said cartridge and biased cam follower means, said cartridge comprising in combination:

(a) at least one blade having a blade edge;

(b) a cap overlaying said blade;

(c) a blade seat for supporting said blade;

(d) a guard bar extending outward beyond the exposed blade edge from said seat; and

(e) means for joining said blade, seat and cap in a predetermined spatial relationship, with said blade seat having a bottom profile with a substantially rectangular perimeter, said profile including pivotable attachment means for engaging said handle positioned at or near each cartridge end, and a cam which is arcuate in cross-section positioned between said attachment means, said cam having a single flat face with continuous outward curve defining a single cam follower track along the entire extent of the cam, said cartridge maintaining the orientation obtained during shaving after the cartridge is removed from the face due to the lack of biasing force to direct the cam back to a central position.

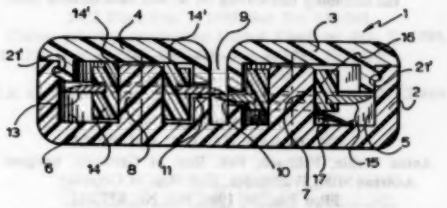
4,693,004

ENVELOPE OPENER

Salvio Plana, 1500, Stanley, #333b, Montreal, Quebec, Canada H3A 1R3

Filed Mar. 28, 1986, Ser. No. 845,852
Int. Cl.[4] B26B *13/00*
U.S. Cl. 30—265 **4 Claims**

1. An envelope opener comprising a rigid casing having a first recess and a second spaced-apart recess formed therein; each said recess being formed around a fixed axial pin; first and second collars, each being rotatably mounted on one of said axial pins; a first cutting disk, being embedded into an intermediate radially outward annular cavity in said first collar, and a second cutting disk, being embedded into an intermediate radially outward annular cavity in said second collar; a guide-slot extending transversely of said casing between and partially intersecting said recesses; each said cutting disk having a radially outward edge portion extending in said guide-slot in overlapping relationship with the other cutting disk edge portion thereby defining two transversely-spaced cutting nips; a compression spring, fitted around the axial pin of said first collar and intermediate said first collar and the bottom of said first recess; said first cutting disk radially outward edge portion being in a lower position relative to said radially outward edge portion of the second cutting disk in said slot; two covers to



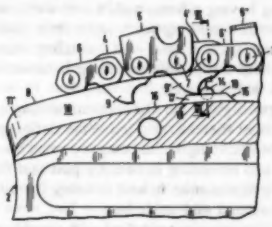
close said casing on both sides of said slot; said compression spring thereby upwardly biasing said first cutting disk against said second cutting disk; and a raised inner annular part being formed in the top surface of said second collar, so as to frictionally contact the inner surface of the corresponding said cover.

4,693,005

GUIDE BAR FOR A SAW CHAIN OF A MOTOR-DRIVEN CHAIN SAW

Anton Wehle, Fellbach; Dieter Unrath, Plüderhausen, and Gunther Zimmermann, Waiblingen, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Aug. 1, 1986, Ser. No. 891,628
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1985, 3528433
Int. Cl.[4] B23D *57/02, 59/04;* B27B *17/12*
U.S. Cl. 30—383 **18 Claims**



1. A guide bar for guiding a saw chain of a motor-driven chain saw as the saw chain is driven, the saw chain including a plurality of cutting links, a plurality of connecting links and a plurality of driving links, the links being pivotally interconnected by rivets or the like and each of the driving links having a raker extending downwardly beyond the connecting links, the rakers having respective lowermost tips, the guide bar comprising:

a flat bar having a peripheral edge;

said bar having two mutually adjacent walls extending along said peripheral edge thereof to conjointly define a groove for receiving the rakers of said driving links therein to guide the saw chain in its movement around the guide bar, the groove having a groove bottom extending between said walls and located at a predetermined distance beneath said tips of said rakers;

lubricating bore means formed in at least one of said walls for conducting lubricating oil to said groove; and,

a stationary part mounted on said groove bottom so as to be immovable with respect thereto and defining surface means for directing the lubricating oil to the immediate vicinity of said tips, said surface means including a first surface for accommodating lubricating oil entering

through said bore means, said first surface extending approximately parallel to and elevated from said groove bottom so as to reduce said distance and permit said tips to pass through the oil on said first surface thereby directing the same upwardly for lubricating the saw chain; and, a second surface extending to said first surface for feeding the incoming lubricating oil to said first surface.

4,693,006

CHAIN SAW HAVING A HANDLE

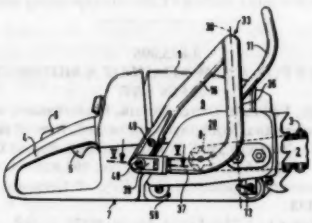
Anton Wehle, Fellbach, Fed. Rep. of Germany, assignor to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Jun. 20, 1986, Ser. No. 877,212

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1985, 3523146

Int. Cl.[4] B27B *17/02*

U.S. Cl. 30—383 10 Claims



1. A motor-driven chain saw comprising:

a housing having a front wall, a rear wall, two longitudinal side walls extending rearwardly from said front wall to said rear wall, a base wall extending between said side walls, and a top wall extending between said side walls above said base wall;

an elongated guide bar for accommodating a saw chain for movement thereon, said guide bar defining a longitudinal axis along its length and being mounted on one of said side walls and extending outwardly past said front wall;

a drive unit mounted in said housing for moving said saw chain around said guide bar;

a protective cover mounted on said one side wall for covering said saw chain at the housing end thereof;

a first handle on said rear wall of said housing for holding and operating the chain saw;

a second handle for holding and guiding the chain saw, said second handle being substantially disposed in a plane transverse to said guide bar at a location between the latter and said first handle, said second handle being spaced from said top wall and said side walls;

said second handle having a first portion spaced from the other one of said sides and extending past said other side so as to be attached to said base wall; said second handle further having a second portion bent out of said plane so as to be directed and extend rearwardly therefrom substantially parallel to and at an elevation corresponding approximately to that of said longitudinal axis of said guide bar, said second portion having a rearward end portion and being spaced away from said one side wall and said protective cover up to the rearward end portion thereof so as to permit an operator of the chain saw to safely grasp said second handle at said second portion; and,

said end portion being attached to said housing thereby securing said second handle to said housing.

4,693,007

GUIDE BAR FOR A CHAIN SAW

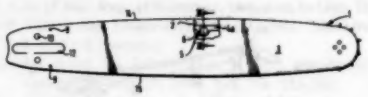
Norbert Apfel; Hans-Peter Stehle, and Wilfried Noll, all of Waiblingen, Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed May 6, 1986, Ser. No. 860,122

Claims priority, application Fed. Rep. of Germany, May 25, 1985, 3518990

Int. Cl.[4] B27B *17/02*

U.S. Cl. 30—387 17 Claims



1. A guide bar for guiding the saw chain of a chain saw comprising:

two flat side members;

an intermediate member sandwiched between said side members;

said side members extending laterally beyond the outer periphery of said intermediate member for conjointly defining a guide groove therewith for guiding the saw chain in its movement around the guide bar;

said intermdeidate member being made of a material non-weldable to said side members and having a specific weight less than the specific weight of the material of which said side members are made;

form-fitting holding means for holding said intermediate member firmly in position between said side members, said form-fitting holding means including a plurality of apertures formed in said intermediate member; and, a plurality of form-fitting elements seated in corresponding ones of said apertures and made of a material weldable to said side members;

said flat side members being made of a solid material devoid of apertures in the regions thereof adjacent respective ones of said elements;

a first plurality of welds for welding corresponding ones of said elements to one of said two flat side members; and, a second plurality of welds for welding corresponding ones of said elements to the other one of said two flat side members.

4,693,008

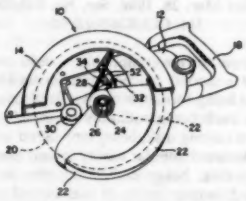
RELEASABLE SEPARATE MEMBER LATCHING DEVICE FOR A PORTABLE HAND TOOL

Wally W. Velie, Ontario, Calif., assignor to Mallard Products, Incorporated, Ontario, Calif.

Filed May 7, 1985, Ser. No. 731,317

Int. Cl.[4] B23D *45/16*

U.S. Cl. 30—390 18 Claims



1. A portable hand tool, which comprises:

means for supporting a movable cutting member for performing a cutting operation on an article;

a pivotable guard member movable between guarding and

unguarding positions with respect to the tool cutting member;

a pivotable latch member pivotally mounted adjacent the guard member and movable between latched and unlatched positions with respect to the guard member, the latch member including a latching portion for engaging a retaining portion of the guard member to preclude movement of the guard member out of its guarding position;

means for moving the pivotable latch member into its latched position;

means for moving the pivotable latch member from its latched position into its unlatched position; and

cooperative means on the pivotable latch member and the guard member for retaining the latch member in its unlatched position as the guard member is moved into its unguarding position during cutting of an article by the tool cutting member.

4,693,009

SCROLLER JIG SAW

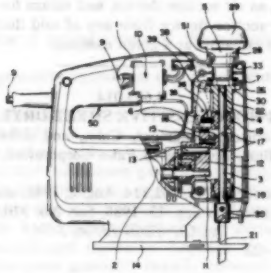
Daniel Bone, Langley Moor, England, assignor to Black & Decker Inc., Newark, Del.

Filed May 9, 1985, Ser. No. 732,419

Claims priority, application United Kingdom, May 11, 1984, 8412057

Int. Cl.[4] B27B *19/09*

U.S. Cl. 30—392 **14 Claims**



1. A scroller jig saw, comprising:

a housing;

a saw blade drive shaft mounted for reciprocating movement relative to said housing along a longitudinal axis and for rotation about said axis;

a motor mounted in said housing and drivingly connected to said drive shaft for reciprocating said drive shaft along said axis;

a scrolling control member accessible to an operator and coupled to said drive shaft for rotation thereof;

locking means for releasably locking said drive shaft against rotation;

said locking means comprising a pivotally mounted lever pivotal between a locking position in which said drive shaft is locked against rotation and a free position in which said drive shaft is free to rotate;

said lever being resiliently biased towards said locking position;

a locking control member accessible to the operator and movable between a scrolling position, in which said locking control member acts upon said lever to hold the latter in said free position, and a non-scrolling position in which said control member allows said lever to be biased into said locking position; and

said locking control member having two manually operable lugs projecting outwardly through openings in opposite sides of said housing at locations adjacent said scrolling control member.

4,693,010

MEASURING EQUIPMENT

Allan W. Sills, Westagon Lodge, Little Hyden Lane, Clanfield, Hampshire PO8 0RU, England

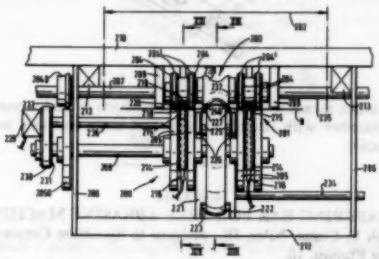
PCT No. PCT/GB85/00249, § 371 Date Feb. 5, 1986, § 102(e) Date Feb. 5, 1986, PCT Pub. No. WO86/00160, PCT Pub. Date Jan. 3, 1986

PCT Filed Jun. 7, 1985, Ser. No. 829,141

Claims priority, application United Kingdom, Jun. 9, 1984, 8414770; Jan. 4, 1985, 8500228; Jan. 4, 1985, 8500229

Int. Cl.[4] G01B *5/06*

U.S. Cl. 33—147 L **24 Claims**



1. A sheet material thickness measuring apparatus having a measuring station defining a path for sheet material, said measuring station comprising:

two pairs of material transport members, said transport members having sheet material guiding peripheral parts movable in the direction of material travel, said pairs of transport members being spaced apart in a direction transverse to the said path, and each pair being opposite each other on either side of said path; and

transducer means positioned between said pairs of material transport members and comprising:

a fixed sensory element at said measuring station on one side of said path; and

a second sensory element at said measuring station on the other side of said path and opposite said first sensory element and being adapted to be moved away from said fixed sensory element upon the passage of sheet material along said path, the amount of such movement being dependent on the thickness of said sheet material;

said transducer means being adapted to propagate an energy field between said sensory elements and give an output corresponding to the change in said energy field caused by the relative movement of said sensory elements upon passage of said sheet material, both said sensory elements bearing directly on said sheet material during its presence between said sensory elements.

4,693,011

APPARATUS FOR ESTABLISHING ANGLES OF OBJECTS

Stephen G. Strayham, Box 542F, Biloxi, Miss. 39532

Filed Jul. 24, 1986, Ser. No. 888,684

Int. Cl.[4] B43L *7/06*

U.S. Cl. 33—451 **3 Claims**

1. An apparatus for mensuration of an angle comprising:

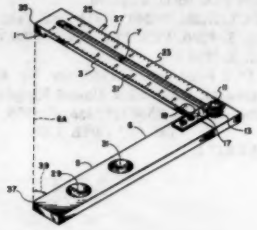
A. a first bar member;

B. a second bar member, slidably affixed substantially perpendicular and co-planar to said first bar member;

C. a first, tangential, graduated scale upon the first bar member;

D. a second, tangential, graduated scale, reciprocally posi-

tioned with respect to the first scale, upon the first bar member; and



E. index means for indicating the position of said second bar member with respect to said first scale and said second scale.

4,693,012

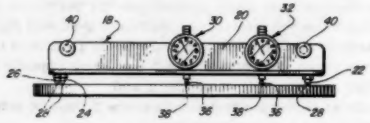
MEASURING BAR FOR FREE ABRASIVE MACHINES

Joseph V. Cesna, Niles, Ill., assignor to Speedfam Corporation, Des Plaines, Ill.

Filed Jul. 16, 1985, Ser. No. 755,685

Int. Cl.[4] G01B *5/20*

U.S. Cl. 33—533 **11 Claims**



1. A measuring bar for determining flatness and deviations therefrom, which comprises: a rigid bar, a plurality of support foot means projecting from said bar, said support foot means having free ends which collectively occupy a common, flat plane, the free ends of each of said support foot means defining a transverse supporting surface essentially 0.005 to 0.025 inch across, and means rigidly carried on said bar from measuring the spacing from said flat plane of at least one point on a target surface against which said support foot means free ends rest, said point being spaced from the support foot means, said spacing measuring means having an area of contact which is essentially 0.005 to 0.025 inch across, for contact with the target surface, one of said support foot means present being adjacent a first end of said bar and a spaced pair of support foot means being present adjacent a second end of said bar, said support foot means being in triangular positional relation to each other, each support foot means of the spaced pair being spaced a different distance from said second end, whereby all three of said support foot means may be positioned equidistantly from the periphery of a disc target surface of predetermined size.

4,693,013

INFRARED DRYER

Manfred Pabst, Cologne, and Peter Mevissen, Erkelenz, both of Fed. Rep. of Germany, assignors to A. Monforts GmbH & Co., Moenchengladbach, Fed. Rep. of Germany

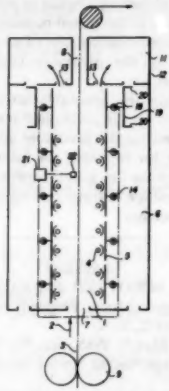
Filed Jun. 19, 1986, Ser. No. 876,379

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1985, 3522695

Int. Cl.[4] F26B *3/30*

U.S. Cl. 34—4 **5 Claims**

1. Infrared dryer, comprising an operating duct being at least as wide as a spread out textile fabric web passing through said duct for treatment, outer ducts disposed outside said operating duct, heating walls formed of adjacent wall elements substantially parallel to the surface of the fabric web separating said operating duct from said outer ducts, infrared radiators disposed on said wall elements, pivot axes about which said wall



elements are pivotable through substantially 180° for moving said infrared radiators between said operating duct and said outer ducts, an air suction device, and means for directing air into said air suction device from any of said ducts containing said infrared radiators at a given moment.

4,693,014

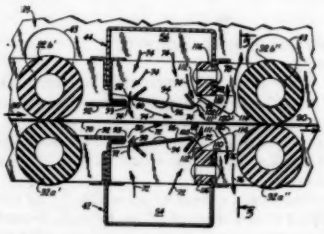
PHOTOSENSITIVE SHEET DRYER

Jerry A. Caflisch, Longmont, Colo., and John D. Ockuly, Blaine, Minn., assignors to Pako Corporation, Minneapolis, Minn.

Continuation of Ser. No. 762,114, Aug. 2, 1985, abandoned. This application Sep. 23, 1986, Ser. No. 910,787

Int. Cl.[4] F26B *13/08, 3/04*

U.S. Cl. 34—23 **21 Claims**



1. A dryer apparatus for drying sheets of photosensitive material which comprises:

a plurality of pairs of opposed drive rollers for supporting a sheet of photosensitive material in a generally planar sheet drying path including an upstream pair of opposed drive rollers and at least one downstream pair of opposed drive rollers, with, each pair of opposed drive rollers being spaced longitudinally along the sheet drying path;

drive means for selectively rotating the drive rollers to move the sheet of photosensitive material in a first longitudinal direction along the sheet drying path;

a plurality of pairs of opposed dryer nozzles facing the sheet drying path from each planar side thereof, each pair of opposed dryer nozzles being between adjacent longitudinally spaced pairs of drive rollers and each dryer nozzle including at least one laterally disposed air inlet;

blower means for blowing air through the air inlet of each dryer nozzle toward the sheet of photosensitive material; and

guide means for guiding the sheet of photosensitive material along the sheet drying path and toward each downstream pair of drive rollers, and the guide means having no obstruction to air flow from the air inlets of the dryer nozzles to the sheet of photosensitive material in the sheet drying path between adjacent pairs of opposed drive rollers to permit air from the blower means to flow longitudinally along each planar side of the sheet of photosensitive matarial in a non-turbulent fashion.

4,693,015

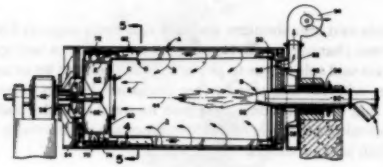
DIRECT FIRED CYLINDER DRYER

Klaus H. Hemsath, and Being-I Fu, both of Toledo, Ohio, assignors to Hercules Incorporated, Wilmington, Del.

Filed Aug. 26, 1985, Ser. No. 769,388

Int. Cl.[4] F26B *3/24, 13/08*

U.S. Cl. 34—41 **18 Claims**



14. A method of drying a material, the method comprising the steps of:

rotating a generally cylindrical dryer shell about a central axis;

passing the material to be dried over an exterior surface of the dryer shell;

combusting fuel to produce hot combustion gases;

directing the hot combustion gases in a first axial direction;

directing the hot combustion gases transversely of the central axis to an area adjacent the dryer shell interior surface;

directing the hot combustion gases in a second, opposite axial direction and thereafter directing jets of the hot combustion gases generally radially outward against the dryer shell interior to transfer heat thereto substantially uniformly over the length and circumference thereof; and,

removing the material from the dryer shell exterior surface.

4,693,016

DRYING APPARATUS

Seiichi Yamazaki; Kaoru Uchiyama, and Toshiro Tahara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 14, 1986, Ser. No. 851,194

Claims priority, application Japan, Apr. 15, 1985, 60-079977

Int. Cl.[4] F26B *13/12, 13/16*

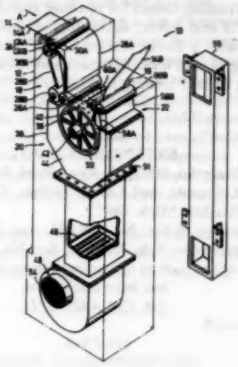
U.S. Cl. 34—52 **11 Claims**

1. A drying apparatus for drying photographic paper having an emulsion layer side and a reverse side in a photographic processing, said apparatus comprising:

(a) a rotary drum, the peripheral surface thereof facing the reverse side of the photographic paper opposite to the emulsion layer side thereof;

(b) a duct facing the peripheral surface of said rotary drum so as to define a photographic paper passing area therebetween, said duct being provided with an air outlet bore for blowing drying air onto the emulsion layer side of the photographic paper; and

(c) air blowing means for blowing the drying air out of the air outlet bore of said duct on the photographic paper, whereby the photographic paper is transported in such a manner that the reverse side thereof is in contact with the outer periphery of said rotary drum, while the emulsion layer side thereof is kept away from said duct, and the photographic paper is dried from the reverse side thereof by means of said rotary drum, and wherein said rotary



drum is rotated at a higher peripheral speed than the speed of travel of the photographic paper, thereby preventing formation of dents in the photographic paper.

4,693,017

CENTRIFUGING INSTALLATION

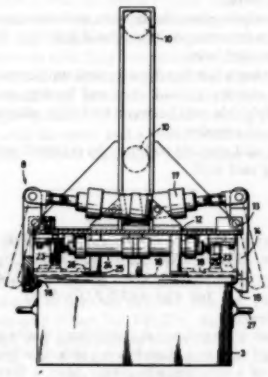
Henry Oehler, Hennef; Norbert Peth, Much; Hans W. Holpp, and Wolfgang Sass, both of Hennef, all of Fed. Rep. of Germany, assignors to Gebr. Steimel, Hennef, Fed. Rep. of Germany

Filed Oct. 16, 1985, Ser. No. 788,063

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1984, 8430403[U]

Int. Cl.[4] F26B *11/08*

U.S. Cl. 34—58 **8 Claims**



1. A centrifuging installation, comprising at least one centrifuge which is loaded and emptied automatically and has an axis, said centrifuge having a centrifuge drum which is provided with the receiving frame, the receiving frame being rectangular in a plan view and having four corners spaced at equal distances from said centrifuge axis;

a plurality of containers which can be filled with industrial piece goods and are insertable into said centrifuge, said container having walls with passages for centrifuged liquid and an upper edge, said containers being formed as boxes in a plan view and insertable into the receiving

frame; fixing means provided in said centrifuge and arranged to hold said centrifuge drum after braking in a predetermined position; a cover arranged to close said boxes and provided with locking means; and gripping means for said boxes, said gripping means being provided with actuating means for opening and closing said locking means of said cover, said gripping means being also provided with a cover holder which fixes said cover after opening of said locking means and releases the same after closing of said locking means.

4,693,018

EXTENDIBLE BOOT

John R. K. Maleyko, 609 Belle River Road, Belle River, Ontario N0R 1A0, Canada, and Gerald Grijak, 4721 Pickwick Dr., Sterling Heights, Mich. 48077

Continuation of Ser. No. 639,501, Aug. 10, 1984. This application Feb. 20, 1986, Ser. No. 831,304

The portion of the term of this patent subsequent to May 6, 2003, has been disclaimed.

Int. Cl.[4] A43B *3/16*

U.S. Cl. 36—1.5 **5 Claims**

1. An extendible boot comprising,

a base portion and an extendible portion,

said extendible portion comprising a flexible sleeve joined to said base portion by a peripherally extending joint and being open at its upper end,

said sleeve being rollable from its upper end to form an annular roll at said joint and thereby provide an unextended boot,

said sleeve being unrollable from said annular roll to a higher position than the position of said joint and thereby provide an extended boot,

a cuff having a fixed end connected with one of said portions in the vicinity of said joint and having an open free end and a foldable part between said ends adapted to be folded over said annular roll,

whereby said annular roll may be retained and concealed by folding said cuff.

4,693,019

SPORTS SHOE PROTECTOR

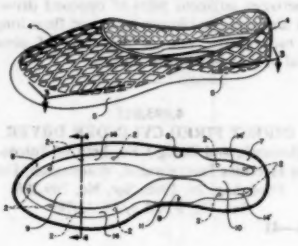
Sun K. Kim, 2381 E. 6780 South, Salt Lake City, Utah 84121

Filed Mar. 3, 1986, Ser. No. 835,345

Int. Cl.[4] A43B *1/10, 5/00*

U.S. Cl. 36—7.3 **6 Claims**

1. A sports shoe protector comprising a sole and a means for securing said sole to a shoe having spikes, wherein said sole is comprised of a substantially planar base, a forward U-shaped shoulder extending from the forward peripheral portion of said base, a rear U-shaped shoulder extending from the rear peripheral portion of said base, a forward inner support extending from said base and positioned at least partially within the mouth of said forward U-shaped shoulder, and a rear inner support extending from the said base and positioned at least partially within the mouth of said rear U-shaped shoulder; wherein the peripheral shape of said base is sized and dimensioned to accommodate said shoe; wherein said forward shoulder provides peripheral support to the forward portion of said shoe when said sole is secured to said shoe; wherein said rear shoulder provides peripheral support to the rear portion of said shoe when said sole is secured to said shoe; wherein said forward inner support provides support to the forward position of said shoe when said sole is secured to said shoe; wherein said rear inner support provides support to the rear portion of said shoe when said sole is secured to said shoe; wherein said forward shoulder and said forward inner support form at least one channel area to receive the forward spikes of said spikes;



wherein said rear shoulder and said rear inner support form at least one channel area to receive the rear spikes of said spikes; wherein said sole serves to protect against damage by or to said spikes; wherein said sole further comprises bridges extending from said base and connecting said forward shoulder and said rear shoulder; and wherein said bridges are substantially thinner than said shoulders.

4,693,020

FLEXION CONTROL FOR SKI BOOT

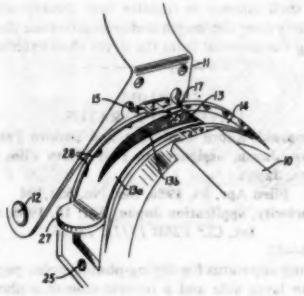
Joseph Salas, Salt Lake City, Utah, and Laurent Boix-Vives, Courchevel, France, assignors to Lange International S.A., Fribourg, Switzerland

Filed Jul. 8, 1986, Ser. No. 883,383

Claims priority, application Switzerland, Jan. 24, 1986, 285/86

Int. Cl.[4] A43B *5/04*

U.S. Cl. 36—117 **20 Claims**



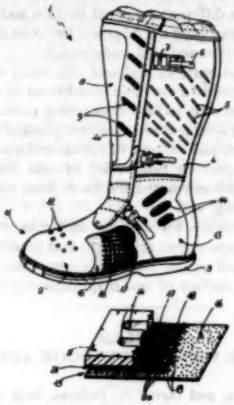
1. A flexion control for a ski boot for controlling the resistance to the forward movement of the upper shell of the ski boot relative to the lower shell, comprising a band of variable elasticity in transversal compression extending transversely across the upper surface of the lower shell, a bumper carried by the lower end of the upper shell to engage one edge of the band, the relative positions of the band and bumper determining the degree of resistance offered by the band to the forward deflection of the upper shell relative to the lower shell, and a rigid surface formed in the lower shell engaging the opposite edge of the band to retain the band.

4,693,021

VENTILATED ITEM OF SPORT FOOTWEAR, PARTICULARLY FOR MOTORCYCLISTS

Sante Mazzarolo, Coste di Maser, Italy, assignor to Alpine Stars S.p.A., Coste di Maser, Italy

Filed Sep. 30, 1985, Ser. No. 781,817
Claims priority, application Italy, Oct. 10, 1984, 59366/84[U]
Int. Cl.[4] A43B 5/14, 7/08, 7/06
U.S. Cl. 36—131 6 Claims



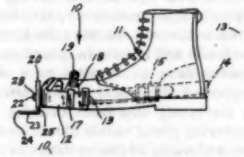
1. A ventilated item of sport footwear comprising:
an upper,
said upper having an inner face in contact with an air-pervious structure,
said structure including:
a mesh in contact with the inner face of the upper; a grid in contact with a side of the mesh opposite the inner face of the upper; and a perforated element in contact with a side of the grid opposite the mesh;
wherein said grid comprises a plurality of knots having spacer elements thereon,
and wherein said upper has a plurality of apertures for allowing air therethrough and through said air-pervious structure.

4,693,022

GARDEN TOOL

John J. Terhune, Sierra Vista, Ariz., assignor to T. Entrepreneur, Inc., Sierra Vista, Ariz.

Filed Feb. 14, 1986, Ser. No. 829,211
Int. Cl.[4] A43C 17/02, 13/00
U.S. Cl. 36—132 10 Claims



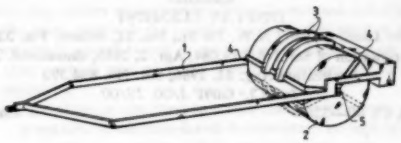
1. An agricultural tool attachment for footwear comprising:
a bracket comprising a vertically disposed channel member having a centrally disposed threaded member extending therefrom;
a garden tool comprising a blade having a slotted plate attached to one end thereof and having a free end at the other end thereof, said slotted plate being of a size to be slideably received into said channel member;
cooperating securing means comprising a threaded nut for being threadably received onto said threaded member for attaching said garden tool to said bracket;
encompassing means comprising a toe encompassing member having a plurality of openings including: end openings; lower openings; and, upper openings formed on each side of said encompassing member; wherein the encompassing member extends partially under, partially over, and around the sides of the toe of said footwear;
first strap means attached to selected ones of said plurality of openings on each side of said encompassing member for extending around a portion of the toe of the footwear for holding said encompassing member securely to said footwear; and,
second strap means attached to selected other ones of said plurality of openings on each side of said encompassing member for extending around the rear and side of the footwear.

4,693,023

SNOW SHAPING MEANS

Tapio Niemelä, Linnatie 10 D 5, 99100 Kittilä, Finland

Filed Mar. 25, 1986, Ser. No. 843,787
Claims priority, application Finland, Mar. 27, 1985, 851223
Int. Cl.[4] E01H 4/00
U.S. Cl. 37—224 3 Claims



1. A snow shaping means comprising a frame, a cylindrical drum having an axle rotatably mounted in the frame, whereby said drum can be towed by means of said frame e.g. behind a vehicle to compact snow, support members pivotably supported on said axle, track shaping elements carried by said support members so that they are movably disposed adjacent the periphery of the drum but separate therefrom, said track shaping elements being rotatable by said support members between an upper position in which said shaping elements are not in contact with the snow and a lower position in which said shaping elements contact the snow and shape track grooves therein.

4,693,024

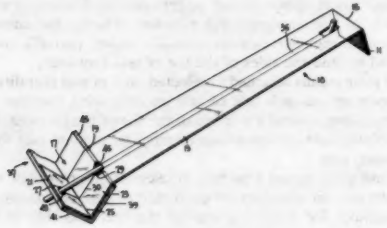
PRODUCT INFORMATION TAGS WITH IMPROVED MOUNTING ARRANGEMENTS

Jacob Fast, 7651 NW. 9th St., Plantation, Fla. 33317

Continuation-in-part of Ser. No. 562,067, Dec. 16, 1983, which is a continuation-in-part of Ser. No. 519,226, Aug. 2, 1983, Pat. No. 4,525,944, which is a continuation-in-part of Ser. No. 473,650, Mar. 9, 1983, Pat. No. 4,531,313. This application Dec. 17, 1985, Ser. No. 809,789
Int. Cl.[4] G09F 3/08
U.S. Cl. 40—20 R 21 Claims

1. A product information and display tag for use in conjunction with an elongate product support hook carried in a V-shaped elongate support member having respective limbs opening upwardly, the hook projecting forwardly in perpendicular relation to the support member and being mounted in openings in the respective limbs, the tag comprising an elongate plastic sheet having at one end a mounting portion for insertion in the V-shaped support, and an elongate intermediate portion extending from the mounting portion for lengthwise projection over the hook to provide product information

at a distal end thereof, the mounting portion including a pair of panels foldable about a transverse fold line to define an angle therebetween substantially conforming to the angle between said limbs, apertures in the respective panels located on a longitudinal center line of the tag, the apertures being connected by a cut extending along said center line across said fold line, the cut enabling the mounting portion to be pressed over a portion of the hook spanning said limbs to snap the apertures over said portion of the hook and situate the apertures in juxtaposition to said openings.



4,693,025

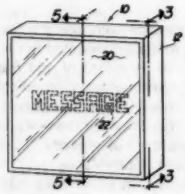
DISPLAY ELEMENT

Pedro Landin, 10807 N.W. 7th St., No. 11, Miami, Fla. 33172

Continuation of Ser. No. 719,084, Apr. 2, 1985, abandoned. This application Aug. 12, 1986, Ser. No. 894,392

Int. Cl.[4] G09F *3/00, 19/00*

U.S. Cl. 40—326 **8 Claims**



1. A display element comprising:

(a) a sealed housing having a transparent front panel and a back panel disposed in spaced relation to said front panel,

(b) a diaphragm-type screen fabricated of thin, pliable material and having a front surface thereof formed of a first particular color and a back surface,

(c) said diaphragm-type screen further comprising a plurality of connecting portions disposed about the margin of said diaphragm-type screen, said connecting portions structured for fixed attachment to an inside portion of said housing,

(d) said diaphragm-type screen further including a mid-portion on which said front surface is formed, and a plurality of marginal portions each formed of pliable material and integrally interconnected between respective ones of said connecting portions and said mid-portion and structured to be movable within said housing for selective positioning of said mid-portion relative to said housing front panel,

(e) said mid-portion and front surface thereon selectively positionable between an aligned, registered and viewable position relative to said housing front panel whereby said front surface is viewable through said housing front panel,

(f) said mid-portion and front surface selectively movable rearwardly from said housing front panel into a non-viewable position, said marginal portions structured for interconnection and restricted placement of said mid-portion and front surface while maintaining interconnection thereof between said connecting portions and said mid-portion of said diaphragm-type screen,

(g) a volume of liquid substantially filling said housing with said diaphragm-type screen therein and having a second particular color which contrasts with said first particular color of said front surface of said diaphragm-type screen,

(h) a plurality of elongated slits each extending along a majority of a different marginal portion and formed contiguous thereto, each slit disposed between the respective marginal portion and said mid-portion,

(i) said marginal portions and said slits being cooperatively disposed to define a movable attachment of said mid-portion of said screen to said connecting portions; said slits disposed and dimensioned to allow passage therethrough of a portion of said volume of liquid, said volume of liquid disposed in part on both sides of said diaphragm-type screen as it moves toward and away from said front panel of said housing, and

(j) displacing means for moving said mid-portion of said diaphragm-type screen relative to said housing front panel being mounted on said housing in communication relation to said back surface of said diaphragm-type screen.

4,693,026

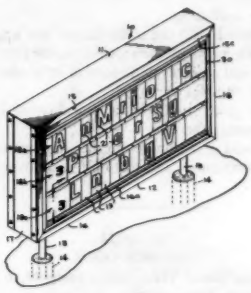
CHANGEABLE MESSAGE OUTDOOR ADVERTISING SIGN

David T. Callahan, and David W. Dobyns, both of Lynchburg, Va., assignors to Allen-Morrison, Inc., Lynchburg, Va.

Filed Aug. 14, 1986, Ser. No. 899,376

Int. Cl.[4] G09F *13/04*

U.S. Cl. 40—576 **20 Claims**



1. A changeable message outdoor advertising sign or the like, comprising a generally rectangular frame forming top, bottom and end walls defining a rectangular surround for an internally illuminated sign section having an interior lamp chamber, a pair of light transmissive thin backing sheet members supported within and spanning the height and horizontal length of the frame and located in spaced apart parallel planes forming opposite faces of the sign, pairs of horizontal track members supported above and below vertically spaced horizontal axes traversing said faces defining plural horizontal rows for displaying plural visible illuminated characters forming messages, a plurality of thin rectangular font panels having parallel planiform front and back surfaces and parallel horizontal edges and parallel vertical edges to be positioned and slidably supported in vertical edge abutting relation with their horizontal edges slidable supported in said tracks between pairs thereof associated with each of said rows and against said backing sheet members, the font panels having clear transparent character image forming areas and having the remainder of each panel of diminished light transmission attenuating proper-

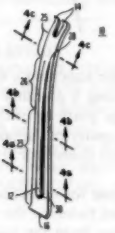
ties to render readily visible the characters to be displayed by the image forming areas, the vertical edges of said font panels being shaped in confronting pairs to interfit intimately with each other along paths inclined in non-perpendicular relation to the planes of said front and back surfaces of said font panels, and tension means at each of said rows having a stationary mounting base member supported adjacent an end wall of said frame and a force transfer bracket member for engaging the nearest edge of the adjacent font panel in the associated row and a spring member connected between said base member and bracket member to be compressed by font members arrayed in the associated row and exert spring pressure thereon maintaining the confronting pairs of vertical edges of the font panels in light-leak-resisting interfitting relation.

4,693,027

VARIABLE POWER FLAT SPRING FOR REVOLVER-TYPE FIREARMS

Walter C. Wolff, Sr., and Walter C. Wolff, Jr., both of Berwyn, Pa., assignors to W. C. Wolff Company, Ardmore, Pa.

Filed Jul. 26, 1985, Ser. No. 759,468
Int. Cl.[4] F41C *1/00, 19/00*; F16F *1/00*
U.S. Cl. 42—59 **4 Claims**



1. A leaf spring for the hammer of a handgun, said spring having a lower butt end and an upper claw end for connection with the hammer, said spring having a tensile-stress face and a compression face, said spring having a rib projecting from the tensile-stress face and forming a channel in the compression face of said spring, said rib and channel extending from near the butt end toward but terminating short of said claw end, said channel having a maximum depth at the butt end and progressively decreasing in depth toward the claw end, whereby during early stages of hammer withdrawal, the potential energy stored in said spring represents a major portion of the total potential energy stored during a complete hammer withdrawal with substantially less potential energy being stored during later stages of hammer withdrawal, thereby to substantially decrease stack-up just prior to hammer release.

4,693,028

METHOD AND APPARATUS FOR SELECTING FISHING LURE COLOR

Loren G. Hill, 2826 Castlewood, Norman, Okla. 73069

Continuation of Ser. No. 665,543, Oct. 26, 1984, Pat. No. 4,599,820. This application Apr. 22, 1986, Ser. No. 855,008
The portion of the term of this patent subsequent to Jul. 15, 2003, has been disclaimed.
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—4.5 **2 Claims**

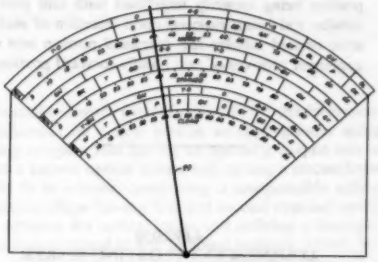
1. The method of catching fish which comprises:

observing the clarity of the water to be fished to determine whether the water is clear or contains material diminishing its clarity in a measurable degree;

measuring the light transmittance at the depth in the water where a fishing lure is to be placed for the purpose of attempting to catch fish;

selecting a color of lure to be used in fishing by matching the observed degree of water clarity and the measured light transmittance with a color of lure which has, by predetermined experimentation, been determined to be that lure color which is the most effective for use under the specific conditions of (a) the light transmittance value measured, and (b) the degree of water clarity observed, said matching of the observed degree of water clarity and the measured light transmittance with a particular lure color being accomplished by:

moving a pointer means in a path of movement in response to the measured light transmittance, so that the magnitude of the movement of the pointer means is directly proportional to the magnitude of the light transmittance measured; and



arranging colors on a chart placed adjacent and parallel to the plane in which the pointer moves so that each of said colors is placed at one or more specific locations on the chart, which one or more specific locations are determined by

(a) the place on the chart to which the pointer means will point after it has complexed its movement in response to a specific magnitude of light transmittance; and

(b) at least one predetermined degree of water clarity at which a bass fish will see the respective specific color better than other colors when located in water of that degree of water clarity and with the light transmittance value at the location of the bass fish during substantially equivalent to said specific magnitude of light transmittance.

4,693,029

FISHING ROD

Shigeru Yamamoto, and Masaru Akiba, both of Tokyo, Japan, assignors to Daiwa Seiko Inc., Tokyo, Japan

Filed Jan. 6, 1986, Ser. No. 816,641
Claims priority, application Japan, Jan. 31, 1985, 60-17486
Int. Cl.[4] A01K *87/06*
U.S. Cl. 43—22 **4 Claims**

1. A fishing rod, comprising:

a hollow tubular rod made of a reinforced fiber impregnated with a thermosetting synthetic resin, said rod having a forward portion and a rearward portion, and further having on the upper side thereof a flat reel seat,

a handle securely fitted to said rearward portion of said tubular rod such that a part of said tubular rod rearward portion is exposed for gripping contact by a user's hand,

a front hood mounted on said butular rod forward portion, said front hood defining a rearwardly facing opening,

a rear hood mounted on said tubular rod rearward portion,

said rear hood defining a forwardly facing opening, said front hood and said rear hood together defining means for fixing the feet of a reel mounted on the reel seat of said tubular rod,

said handle including a forward portion for engagement with said rearward portion of said tubular rod, said handle forward portion including laterally disposed engagement grooves, and

a slot in at least one of the upper or lower sides of said rearward portion of said hollow tubular rod, whereby, in cross-section, said rearward portion of said tubular rod includes at least a pair of laterally opposed, spaced arms, said handle forward portion and said tubular rod rearward portion being securely interfitted with said part of said tubular rod being exposed upon insertion of said spaced arms of said tubular rod rearward portion into said engagement grooves of said handle forward portion.

4,693,030

LUMINESCENT FLOATING SINKER

Michael J. Wohead, P.O. Box 295, Naperville, Ill. 60566

Filed Feb. 28, 1986, Ser. No. 834,767

Int. Cl.[4] A01K *95/00*

U.S. Cl. 43—42.22 **12 Claims**

1. A sinker for a fishing lure which sinker rides upright adjacent a bottom of a body of water to carry the lure over snagging obstructions, said sinker comprising an elongated light weight transparent tube having a sealed buoyant chamber, luminescent material in said chamber causing the tube to project light, said tube having a top end above said chamber with means for attachment to a fishing line, said tube having an open bottom chamber below said sealed buoyant chamber, a weight removably mounted in the open bottom chamber of said tube, and means releasably locking said weight in said open bottom chamber of the tube, said means including a pair of slots in a wall of the bottom chamber, a transverse hole in the portion of said weight, a pin extending through said slots and hole and a sleeve slidable on the tube to cover and uncover said slots so that weights of different sizes are selectively carried by said tube to carry the sinker upright at a desired depth in the water.

4,693,031

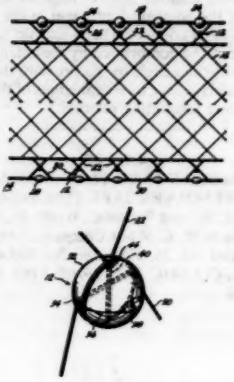
LINE CONNECTOR

John R. Koetje, 1314 McLean Rd., Mount Vernon, Wash. 98273

Continuation-in-part of Ser. No. 684,912, Dec. 18, 1984, abandoned. This application Jan. 22, 1985, Ser. No. 694,055

Int. Cl.[4] A01K *71/00, 93/00*

U.S. Cl. 43—44.91 **12 Claims**



4. A connector for attaching a fishing net to a support line, with the net including a plurality of spaced-apart net twines attached to the edge portions of the net and with the support line including a plurality of support line twines spaced along the support line, said connector comprising:

(a) a body;

(b) a first cross hole for reception of a first twine composed of either the net twine or the support line twine;

(c) a slit extending from the outer periphery of said body, through a portion of said body to intersect said first cross hole along the length thereof, said slit adapted to permit passage of the first twine through said body to engage within said first cross hole;

(d) a second cross hole extending through said body generally transversely to said first cross hole and intersecting either said first cross hole or said slit for reception of a second twine composed of the other of the net twine or the support line twine doubled upon itself; and,

(e) a groove extending around substantially the entire periphery of said body to intersect the end portions of the second cross hole but not the length of said second cross hole intermediate the ends of said second cross hole for reception of a looped, central portion of the second twine extending through said second cross hole thereby to render captive the first twine in said first cross hole.

4,693,032

ILLUMINATED FISHING LURE

Robert N. Mattison, 5826 McKinley Pl., North Seattle, Wash. 98103

Continuation-in-part of Ser. No. 607,284, May 4, 1984, Pat. No. 4,589,221, and a continuation-in-part of Ser. No. 648,458, Sep. 7, 1984, Pat. No. 4,581,839. This application Dec. 23, 1985, Ser. No. 813,677

The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.

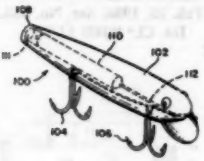
Int. Cl.[4] A01K *85/00*

U.S. Cl. 43—17.6 **15 Claims**

1. An illuminated fishing lure for housing an elongated chemiluminescent capsule having a resilient outer surface, comprising;

an elongated body including a longitudinally extending cavity at least as long as the capsule, the cavity being formed in the body by a pair of opposed generally planar

sidewalls spaced apart a distance sufficient to receive the chemiluminescent capsule therebetween, the cavity having first and second opposed longitudinally extending openings communicating with the body cavity and sized large enough to allow lateral passage of the capsule therethrough, the body further including at least one protrusion attached to one of the sidewalls and projecting into the



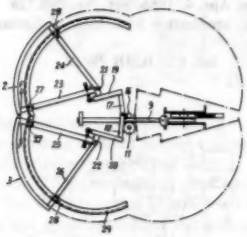
first cavity opening a sufficient distance such that a chemiluminescent capsule can be pushed past the protrusion by deforming its resilient outer layer for positioning the capsule within the cavity for use of the lure or removal of the capsule from within the cavity, but cannot pass by the protrusion once within the cavity under the normal forces encountered on the capsule during use of the lure.

4,693,033

MECHANISM FOR OPENING, CLOSING AND LOCKING TWO LEAVED DOORS FOR CABLE CARS

Francis Tauzin, Veyrins, France, assignor to Sigma Plastique and Pomagalski S.A., both of, France

Filed Apr. 2, 1986, Ser. No. 847,386
Claims priority, application France, Apr. 3, 1985, 85 05055
Int. Cl.[4] E05C 7/06
U.S. Cl. 49—122 **6 Claims**



1. In a passenger transporting cable car having a door comprising two leaves symmetrical to each other with respect to a vertical plane passing through the junction line of the two leaves in the closed position, a mechanism for actuating said door which comprises:

a control piece disposed at one of the heightwise ends of the car and having a horizontal rectilinear movement parallel to the vertical plane of symmetry of the two door leaves,

a crank lever integral with said control piece and adapted to actuate a horizontal dead point clearance toggle joint, said toggle joint being formed of two symmetrical links each actuating a lever,

at least one arm fixed to each one of said door leaves and adapted to pivot about a fixed axis, said arm being connected to a lever of said toggle joint,

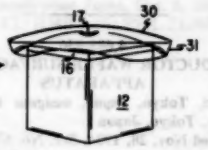
and a resilient connection between said arm and said lever allowing a limited oscillation of the corresponding door leaf in a closed position with respect to the lever, and consequently allowing a gap between the two door leaves in the closed position locked by the position of the toggle joint brought beyond its dead point.

4,693,034

MASTER PATTERN ASSEMBLY FOR LENS CIRCUMFERENCE GRINDING

David F. Vance, Rte. #2, Box 228 EE, Bloomfield, Ky. 40008, and Michael Jakubowicz, 4701 Lacarem Dr., Jeffersontown, Ky. 40299

Filed Sep. 10, 1985, Ser. No. 774,580
Int. Cl.[4] B24B 9/00
U.S. Cl. 51—101 LG **5 Claims**



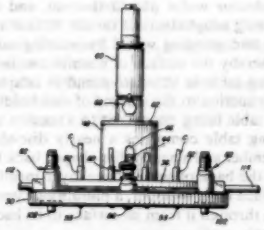
5. A rotatable master pattern assembly for the formation of a circumference on a new lens in an edge grinder using a preexisting eyeglass lens having an optically shaped side surface with a known optical center and having a circumference known to fit in a frame; comprising: a compressible adhesive pad of known shape having first and second opposed surfaces bearing adhesive for optical lenses and defining a throughgoing sight bore centered in said opposed surfaces; a body block defining an axial throughgoing bore adapted to surround and engage a cylindrical penholder of an edge grinder machine; said body block defining a curved top surface to substantially complement the optically shaped side surface of a preexisting eyeglass lens, said top surface of said body block adhering to said first surface of said adhesive pad such that said axial bore is axially aligned with said sight bore and said top surface completely contacts said first surface with the second surface of said adhesive pad adhering to the side surface of the preexisting eyeglass lens and said sight bore being aligned with the optical center of said preexisting eyeglass lens.

4,693,035

MULTIPLE OPTICAL FIBER POLISHING APPARATUS

Ralph R. Doyle, Arlington Heights, Ill., assignor to Buehler Ltd., Lake Bluff, Ill.

Filed Oct. 30, 1985, Ser. No. 792,785
Int. Cl.[4] B24B 7/22
U.S. Cl. 51—125 **17 Claims**



1. Apparatus for simultaneously polishing multiple fiber optic ends which project from the ends of corresponding fiber optic cables, said cables each having a fiber optic connector attached adjacent an end thereof, said apparatus comprising, in combination, connector holder plate means having a plurality of seat means, one for seating each of a plurality of fiber optic connectors, said seat means including openings which permit each fiber optic end to project through said connector holder plate means for engagement with polishing means, and lock plate means mounted coaxially to said connector holder plate means and rotatable relative thereof, said lock plate means

having a plurality of generally keyhole-shaped openings, one opening corresponding to each of said seat means, said lock plate means being rotatable between a loading position where larger portions of said keyhole-shaped openings are aligned with said seat means to permit insertion of a fiber optic connector through each of said keyhole-shaped openings into a corresponding one of said seat means and a locked position where smaller portions of said keyhole-shaped openings are aligned with said set means to lock said fiber optic connectors in said seat means.

4,693,036

SEMICONDUCTOR WAFER SURFACE GRINDING APPARATUS

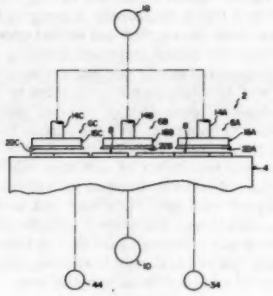
Toshiyuki Mori, Tokyo, Japan, assignor to Disco Abrasive Systems, Ltd., Tokyo, Japan

Filed Nov. 28, 1984, Ser. No. 675,786

Claims priority, application Japan, Dec. 28, 1983, 58-199451[U]

Int. Cl.⁴ B24B *7/04*

U.S. Cl. 51—131.3 **3 Claims**



1. A grinding apparatus comprising a supporting base and at least one grinding wheel assembly disposed to face said supporting base,

said supporting base including at least one holding table,

said grinding wheel assembly including a rotatably mounted supporting shaft and a grinding wheel mounted to said supporting shaft,

the surface of said holding table being adapted to have a semiconductor wafer placed thereon, and said grinding wheel being adapted to act on the surface of a wafer by rotating said grinding wheel by rotating said supporting shaft whereby the surface of a wafer can be ground,

said holding table is ventilative and is adapted to hold a wafer by suction to the surface of said holding table, said holding table being connected to a suction source,

said holding table comprises a nearly disc-shaped surface layer member and a nearly disc-shaped back layer member fixed to the back of said surface layer member,

in said surface layer member, a plurality of ventilation holes piercing through it from its surface to its back are formed at intervals, and

said back layer member being provided with a communicating means for communicating said suction source with said ventilation holes of said surface layer member,

said ventilation holes formed in said surface layer member being arranged along a plurality of concentrically arranged circles,

said communicating means formed in said back layer member comprises a plurality of concentric circular grooves formed on the surface of said back layer member corresponding to the circles of said ventilation holes, a plurality of radial grooves formed on the surface of said back layer member for communicating said circular grooves with one another and at least one communicating hole extending from one end open to said circular grooves and/or said radial grooves to the back of said back layer member piercing through it.

4,693,037

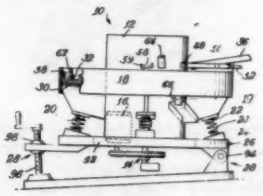
MULTISTAGE FINISHING DEVICE AND METHOD

Gary L. McNeil, Allegan, Mich., assignor to Roto-Finish Company, Inc., Kalamazoo, Mich.

Filed Feb. 25, 1986, Ser. No. 833,203

Int. Cl.⁴ B24B *31/06*

U.S. Cl. 51—163.2 **49 Claims**



1. A vibratory finishing machine for the surface finishing of parts or workpieces comprising an essentially spiral trough, having a plurality of channels in side-by-side relationship, resiliently mounted for vibration and tilted with respect to the horizontal so as to provide a high side and a low side to said spiral trough.

4,693,038

APPARATUS FOR OPTICALLY MONITORING THE SURFACE FINISH OF GROUND WORKPIECES

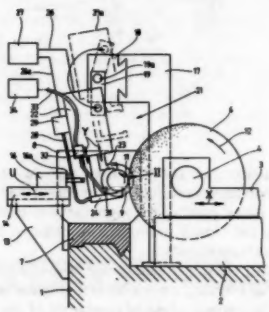
Ulrich Vetter, Stuttgart, Fed. Rep. of Germany, assignor to Schaudt Maschinenbau GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 4, 1986, Ser. No. 848,728

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1985, 3512595

Int. Cl.⁴ B24B *49/12*

U.S. Cl. 51—165.72 **13 Claims**



1. Apparatus for ascertaining the parameters of a workpiece during treatment in a grinding machine while the workpiece is contacted by the rotary grinding tool of the grinding machine, comprising first monitoring means for ascertaining a first parameter of the workpiece; second monitoring means for ascertaining a second parameter including the quality of surface finish of the workpiece, at least a portion of one of said monitoring means being mounted on the other of said monitoring means, said second monitoring means comprising a radiation source, a radiation focusing device arranged to direct radiation upon the surface which is contacted by the grinding wheel whereby at least some of the thus directed radiation is reflected

by the surface of the workpiece, means for conveying radiation from said source to said focusing means, at least one transducer arranged to convert optical signals, and means for conveying reflected radiation to said transducer; means for applying to the surface of the workpiece a coat of a lubricating agent; and means for removing such coat in the region where radiation impinges upon the surface of the workpiece so that radiation is reflected by an uncoated portion of the surface.

4,693,039

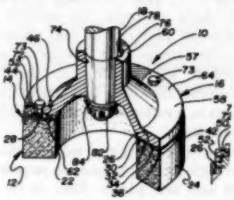
GRINDING HEAD ASSEMBLY

Robert G. Vieau, Plymouth, and William D. Klempke, Brooklyn Park, both of Minn., assignors to Loram Maintenance of Way, Inc., Hamel, Minn.

Continuation of Ser. No. 696,753, Jan. 31, 1985, abandoned. This application Jun. 3, 1986, Ser. No. 871,170

Int. Cl.⁴ B24B *41/00*

U.S. Cl. 51—168 **9 Claims**



1. A grinding head assembly, comprising:

an abrasive grinding element having a grinding surface and a generally annular opposed top surface;

a rigid, generally annular backing plate having a generally annular first surface operably coupled to and esentially covering said grinding element top surface, said first surface comprising an annular, generally planar face and a plurality of radially spaced concentric ribs projecting outwardly from said face and an opposed, second surface spaced apart from said first surface to define a backing plate width;

a generally cylindrical attachment boss projecting outwardly from said second surface and spaced apart from said grinding element by said backing plate width, said boss defining a boss diameter extending across at least two of said concentric ribs, and including structure defining an internally threaded boss channel;

a backing plate holder adapted to be drivingly connected for rotation with a drive shaft, said backing plate holder including an attachment surface including structure defining a cavity for receiving said boss in a complementary fit whereby the rotational energy of said backing plate holder is transferred to said boss and distributed along said rigid, generally annular backing plate, through said backing plate width, to said grinding element; and

attachment means extending through said cavity and receivable in threaded engagement by said boss channel for detachably coupling said backing plate to said backing plate holder.

4,693,040

SIMULTANEOUSLY GROUND TYPE BEARING BODY AND UNLIMITED SLIDING BEARING UNIT EMPLOYING THE SAME

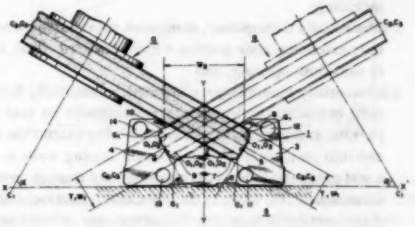
Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-Ku, Tokyo, Japan

Continuation of Ser. No. 688,642, Jan. 4, 1985, abandoned, which is a continuation of Ser. No. 519,858, Aug. 3, 1983, abandoned. This application Apr. 7, 1986, Ser. No. 851,300

Claims priority, application Japan, Oct. 9, 1982, 57-178162

Int. Cl.⁴ B24B *1/00*; F16L *33/64*

U.S. Cl. 51—291 **7 Claims**



1. A method of manufacturing a bearing body of substantially U-shaped cross section having a mounting surface formed on its top and a central cavity defined in its central lower part by a cavity lower surface and two skirts having opposed inner peripheral side surfaces, said method comprising the steps of forming a pair of opposite recesses in the inner peripheral side surfaces of said skirts, each of said recess having a bottom surface inclined at an angle of about 55 degeees to about 65 degrees relative to said mounting surface and a pair of opposite side surfaces extending inwardly from said bottom surface, and simultaneously grinding the opposite sides of each recess by using a grinding wheel having a diameter greater than the width of said cavity at said cavity lower surface and a thickness equal to the width of the recess to be ground so as to form a pair of longitudinally extending ball rolling surfaces in each recess, the grinding wheel being brought into contact with each recess with an infeed angle equal to the angle of inclination of said bottom surface of the related recess.

4,693,041

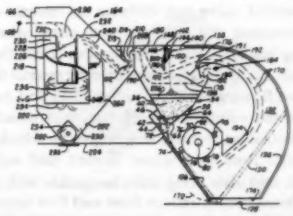
SURFACE BLASTING APPARATUS

Wayne E. Dickson, Tecumseh, Okla., assignor to Dickson Industries, Inc., Tecumseh, Okla.

Division of Ser. No. 498,846, May 27, 1983, abandoned. This application Oct. 4, 1985, Ser. No. 784,532

Int. Cl.⁴ B24C *7/00, 9/00*

U.S. Cl. 51—424 **2 Claims**



1. In a surface blasting apparatus having abrasive projecting means to project abrasive toward a surface to be treated, said abrasive projecting means including a rotating wheel adapted to propel abrasive falling into contact with the wheel along a

line parallel to the rotational axis of the wheel into a curtain extending substantially parallel to that rotational axis and against the surface to be treated, the improvement which comprises a abrasive flow-control system acting in cooperation with said abrasive propelling wheel, and comprising:

an abrasive storage compartment with a lowermost portion defined by a pair of sloping walls each have inclined surfaces which are inclined at an acute angle to the vertical, and which walls converge at thier lower ends to define a flow opening therebetween;

a flow-control valve positioned adjacent said flow opening and movable to open and close said opening, said valve including:

a substantially monoplanar, elongated, substantially horizontally extending main portion which is at least equal, in size to said flow opening; and

a substantially monoplanar, elongated, substantially horizontally extending lip extending perpendiular to said main portion, at one side thereof, said lip being extendible under and into juxtaposition to one of said sloping walls to form a seal preventing abrasive flow from said storage compartment when the valve is in the closed position and said main portion is adjacent the other one of said sloping walls, said main portion and lip forming together an elongated, horizontally extending, abrasive-receiving angle from which abrasive particles will fall in a gravitating curtain of uniform particle density over the transverse width of the curtain;

a hinge hingedly and pivotally attaching one side of said main portion to said storage compartment for pivotation. about a horizontal axis for retaining said main portion and the lip extending therefrom in a horizontally extending status, whereby a closed position of the value is defined when said valve is pivoted to, and covers, said flow opening, said hinge being disposed along the opposite side of said main portion from the side of said main portion from which said lip projects substantially perpendicular to said main portion;

means for rotating, in a selectively variable fashion, said valve about said hinge and toward and away from said flow opening, thus defining a variable open position of said valve, said variable open position allowing a priportionate amount of abrasive to gravitationally flow through said flow opening, said rotating means comprising:

a shaft attached to the main portion of said flowcontrol valve; and

actuation means to rotate said shaft about said hinge to open and close said valve, said actuation means comprising a remotely controlled power cylinder; and

a detachable plate adjustably attached to one of the slanted walls of said abrasive storage compartment above said flow-control valve and defining an internal opening of predetermined size through said plate, which internal opening has a width less than a width of said flow opening between said sloping walls to thereby restrict the width of abrasive flowing through said opening and to ultimately restrict the width of said curtian, said detachable plate thus controlling the rate and pattern by which abrasive is projected from said wheel toward said surface to be treated, said plate being interchangeable with other plates of different configurations from said first mentioned plate to provide selectively predetermined flow patterns of abrasive through said opening in said other plates and into contact with said abrasive propelling wheel, whereby a selectively wider or a narrower curtain of abrasive may be gravitated onto said abrasive propelling wheel.

4,693,042

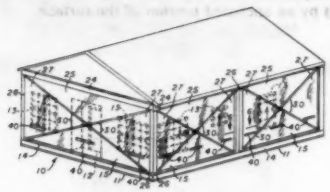
SYSTEM OF FLOOD PROTECTION FOR BUILDINGS

Carlos E. Villarreal, 22615 Pebworth Pl., Spring, Tex. 77373

Filed Oct. 20, 1986, Ser. No. 920,751

Int. Cl.[4] E02D *27/00*

U.S. Cl. 52—169.14 **33 Claims**



1. A system of flood protection for a building having a foundation comprising the combination with said building of;

a lower continuous skirt of plastic film secured to said building foundation by a waterproof seal,

means secured to said building in a fixed position enclosing and supporting said lower plastic film skirt in a rolled or folded condition adjacent to said foundation,

an upper continuous skirt of plastic film secured to an upper level of said building above the maximum projected rise of flood waters,

means secured to said building in a fixed position enclosing and supporting said upper plastic film skirt on said building in a rolled or folded condition at said upper level,

a pair of side skirts of plastic film secured to said building exterior adjacent each end of said upper and said lower skirt supporting means by a waterproof seal, and

means secured to said building in laterally spaced fixed vertical positions enclosing and supporting said side plastic film skirts in a rolled or folded condition adjacent said building exterior,

said upper, said lower, and said side plastic film supporting means each being easily opened to permit said upper, said lower, and said side plastic films to be unrolled or unfolded toward each other, and

said lower, said upper, and said side plastic film skirts each extending around said building and each having edge portions providing a waterproof seal with the other and being of a size and shape permitting said edges to be quickly joined in a water tight seal to prevent flood waters from entering said building.

4,693,043

DECORATIVE WINDOW ASSEMBLY

Michael E. Knapp, Dayton, Ohio, assignor to American Woodwork Specialty Co., Inc., Dayton, Ohio

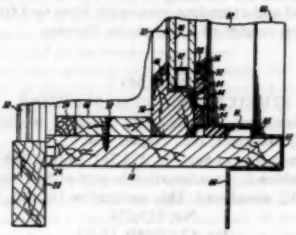
Continuation of Ser. No. 824,855, Jan. 31, 1986, abandoned. This application Jan. 29, 1987, Ser. No. 8,636

Int. Cl.[4] E06B *1/04*; E04F *19/02*

U.S. Cl. 52—211 **3 Claims**

1. A decorative window assembly comprising at least one flat semi-circular window panel of light transmitting material, a semi-circular wood frame extending completely around said window panel and including semi-circular wood jamb members having portions projecting forwardly generally perpendicular to said window panel, a set of wood sash members secured to said jamb members and defining a recess receiving a peripheral edge portion of said window panel, a heat and pressure formed sheet of plastics material having a uniform thickness and forming a one-piece semi-circular cap member mounted on said frame, said cap member including integrally connected U-shaped portions extending completely around said window panel and mounted on said forwardly projecting portions of said jamb members, said U-shaped portions including inner wall sections having a stepped cross-sectional config-

uration and forming a peripherally extending shoulder, said sheet of plastics material forming an integral outer flange portion projecting outwardly around said U-shaped portions generally parallel to said window panel, said sheet of plastics material also forming integrally connected and coplanar inner flange portions projecting inwardly from said inner wall sections and extending completely around said window panel forwardly of said sash members and said window panel in parallel spaced relation to said window panel, said coplanar inner flange portions covering said sash members and said peripheral edge portion of said window panel within said



recess, said sheet of plastics material further forming an integral lip portion extending completely around said peripheral edge portion of said window panel and projecting rearwardly from said inner flange portions to said window panel, and means forming a fluid-tight seal between said lip portion and said peripheral edge portion of said window panel, whereby said one-piece cap member extends continuously from said outer flange portion to said window panel completely around said semi-circular wood frame and sash members and forms a continuous protective barrier from said outer flange portion to said window panel.

4,693,044

DEVICES FOR PRESTRESSING CONCRETE HAVING STRETCHED SINUOUS CABLES AND THE METHODS FOR IMPLEMENTING SAME

Pierre Jartoux, Epernon, France, assignor to Freyssinet International (Stup), Coignieres, France

Filed Oct. 8, 1986, Ser. No. 916,790

Claims priority, application France, Oct. 10, 1985, 83 15030

Int. Cl.[4] E04C *3/10, 5/08*

U.S. Cl. 52—230 **2 Claims**

1. A device for prestressing a concrete element comprising at least one elongated sinuous cable formed by a bundle of metal strands, the bundle being housed in an elongate sheath which is embedded over at least a part of its length in the concrete element, each cable strand being contained in a tube of plastic material and the tubes having a transverse distribution which is irregular within the cable, the tubes being fixed in their relative positions by means of a solidified cement grout filling spaces defined between the tubes and the inside of the sheath.

4,693,045

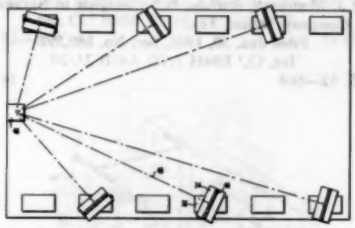
EXHAUST STACK SUPPORT ARRANGEMENT

Thomas J. Rahaim, Claymont, Del., and Nicholas D. Xanthopoulos, Havertown, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 30, 1985, Ser. No. 760,380

Int. Cl.[4] E02D *27/42*

U.S. Cl. 52—292 **2 Claims**



1. A support arrangement for mounting, on a concrete or similar material foundation pad, a large exhaust stack for a gas turbine or the like in which the base of the stack is subject to significant thermal expansion and contraction due to changes in base temperature in accordance with the operating condition of the turbine, comprising:

means anchoring and supporting one relatively small, discrete area of said base from said pad in substantially fixed position relative to said base area;

a series of separate support columns between said pad and the underside of said base in an array to adequately support the entire area of said base;

each support column including a structural beam segment including top and bottom flange means and an intermediate web, said top and bottom flange means being fixed against movement to said base and said pad, respectively;

each support column being oriented with the web thereof substantially transverse to a line passing through said anchor location and said web so that each web is disposed to permit bending to the required extent in accordance with the lateral and longitudinal displacement of the base at the particular column location, relative to said anchor location.

4,693,046

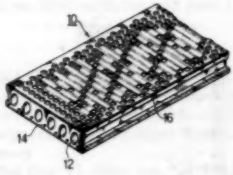
METHOD OF CONSTRUCTING FLOOR FOR BUILDINGS OR SIMILAR STRUCTURES

Yoshihiro Murayama, Hongo House 1105, 27-8, Hongo-1-chome, Bunkyo-ku, Tokyo, Japan

Filed May 13, 1985, Ser. No. 733,329

Int. Cl.[4] E04B *5/19*

U.S. Cl. 52—520 **3 Claims**



1. A multi-directional concrete floor comprising:

(a) a precast reinforced concrete slab having generally flat upper and lower surfaces, the upper surface defining a multiplicity of generally cylindrical cavities; and

(b) a concrete layer superimposed only on the slab upper

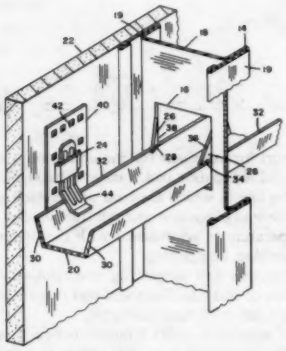
surface, the layer having a generally flat lower surface formed with a multiplicity of generally cylindrical shear members extending downwardly into interlocking contact with the slab cylindrical cavities, so that the shear members prevent relative movement between the slab and layer in all horizontal directions under bending forces.

4,693,047

BENDABLE CHANNEL RETAINER

Robert J. Menchetti, Buffalo, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Filed Jun. 30, 1986, Ser. No. 880,592
Int. Cl.[4] E04H *1/00;* **A43B** *23/20*
U.S. Cl. 52—664 **16 Claims**



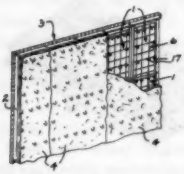
1. A vertical metal stud comprising a pair of opposed face portions and a central web, said web having a plurality of openings for the reception of horizontal channels therethrough, said web openings having a pair of bendable tabs hingedly formed at the two sides of the upper portion of said web opening positioned to firmly abut and restrain a channel in the lower portion of said web opening when said tabs are in an inwardly bent position, said bendable tabs being hingedly bendable to an outwardly bent position sufficient to permit movement of an upwardly opening channel from the upper portion of said web opening to a firm upwardly opening channel position in the lower portion of said web opening.

4,693,048

MEDIA SUPPORT MODULE FOR PAINT SPRAY BOOTHS AND THE LIKE

Timothy L. Guetersloh, Madison, Wis., assignor to Research Products Corporation, Madison, Wis.

Filed Sep. 15, 1986, Ser. No. 906,932
Int. Cl.[4] E04C *2/42;* **B01D** *39/04*
U.S. Cl. 52—664 **11 Claims**



1. A support module **(1)** for use in forming the walls of a paint spray booth or the like and for holding air treatment media **(4)** thereto, comprising, in combination:

(a) a generally rectangular frame **(5)** having front and rear portions and spaced top and bottom end members **(7)** connected by side members **(8)**, and with said end and side members **(7, 8)** having inwardly extending flanges **(10)** disposed at the front of the frame,

(b) a generally rectangular grid **(6)** having spaced horizontal and vertical bars **(15, 16)**, and with said grid being removably mountable to said frame,

(c) first cooperative means **(11–13, 15*a*)** for removably latching one portion of said grid to said frame top end member **(7)**,

(d) second cooperative means **(10, 14, 15*b*)** for removably locking another portion of said grid to said frame side members **(8)**,

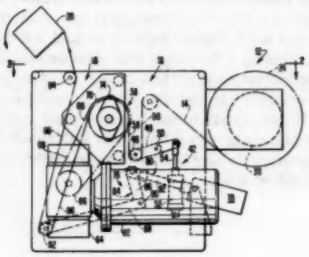
(e) and a plurality of impalement members **(17)** mounted to said grid and extending outwardly from said front of said frame for receipt of a said media thereon.

4,693,049

STRETCH WRAPPING MACHINE

John R. Humphrey, Naples, Fla., assignor to International Packaging Machines, Inc., Naples, Fla.

Continuation-in-part of Ser. No. 374,741, May 4, 1982, Pat. No. 4,590,746, which is a continuation-in-part of Ser. No. 307,283, Sep. 30, 1981, abandoned. This application Dec. 24, 1985, Ser. No. 813,074
Int. Cl.[4] B65B *11/04*
U.S. Cl. 53—64 **9 Claims**



1. A wrapping machine for wrapping a load placed on a rotatable turntable with constant wrapping tension with a stretchable wrapping material which has been prestretched prior to wrapping around the load comprising:

(a) a rotatable holder for holding a roll of stretchable wrapping material which supplies the stretchable wrapping material to be wrapped around the load;

(b) braking means coupled to the rotatable holder for applying a braking force to the holder in accordance with a brake control signal applied thereto to cause the film disposed on the rotatable holder to be restrained as a function of the control signal;

(c) a single driven roller disposed between the roll of stretchable wrapping material and the rotatable turntable which contacts the stretchable wrapping material for applying a force to the stretchable wrapping material to cause prestretching of the stretchable wrapping material disposed between the roll of stretchable wrapping material and the driven roller and for changing the velocity of stretchable wrapping material being delivered to the load to maintain constant wrapping tension;

(d) a variable speed electric motor and control means for rotating the driven roller to apply the force to cause prestretching of the stretchable wrapping material disposed between the roll of stretchable wrapping material and the driven roller and to change the velocity of the stretchable wrapping material being delivered to the load to maintain constant wrapping tension;

(e) means for setting an amount of prestretching;

(f) means for maintaining a constant wrapping tension on the

stretchable wrapping material being wrapped around the load which is disposed between the driven roller and the rotatable turntable and which controls the speed of the variable speed electric motor as a function of first and second control signals applied to the control means;

(g) said maintaining means including means for sensing an increase in the velocity of the stretchable wrapping material delivered to the load to generate the first control signal which is coupled to the control means to cause an increase in the velocity of the stretchable wrapping material delivered to the load;

(h) said maintaining means including means for sensing a decrease in the velocity of the stretchable wrapping material delivered to the load to generate the second control signal which is coupled to the control means to cause a decrease in the velocity of the stretchable wrapping material delivered to the load;

(i) first velocity sensing means for sensing the peripheral velocity of the roll of stretchable wrapping material and for generating a third signal representative of the sensed peripheral velocity of the roll of stretchable wrapping material;

(j) a second velocity sensing means for sensing the speed of rotation of the driven roller and for generating a fourth signal representative of the speed of rotation of the driven roller which is a function of the amount of prestretching occurring between the roll of stretchable wrapping material and the driven roller and a set constant wrapping tension;

(k) means, coupled to the means for maintaining constant wrapping tension, for setting the amount of constant wrapping tension;

(l) a controller, responsive to the third and fourth signals and the set amount of prestretching, for generating the brake control signal; and

(m) the constant tension stretch wrapping and prestretching being powered by only the driven roller.

4,693,050

BOTTLE PLATE IN A BOTTLE-PROCESSING MACHINE

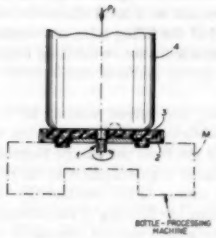
Egon Höveler, Haan, Fed. Rep. of Germany, assignor to Jagemberg AG, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 18, 1986, Ser. No. 853,728

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1985, 3514239

Int. Cl.[4] B32B *5/16*

U.S. Cl. 53—137 **4 Claims**



1. In a bottle-processing machine wherein bottles are individually clamped against a bottle plate which is rotatable to rotatably entrain the bottle thereon, the improvement wherein said bottle plate comprises:

a metal disk; and

a flexible covering on an upper surface of said disk against which said bottle is pressed, a multiplicity of small hard sharp-edged frangible granules composed of a material selected from the group which consists of corundum, silicon carbide and mixtures thereof being embedded in said flexible covering and having projections exposed on a surface of the covering and engageable with a bottom surface of said bottle when said bottle is pressed against said covering.

4,693,051

MACHINE FOR BOXING ITEMS IN GROUPS

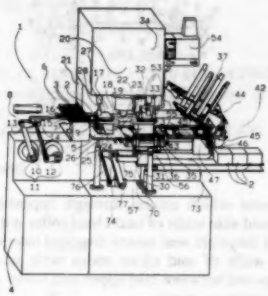
Riccardo Mattei, Bologna; Giordano Gorrieri, Pianoro, and Gualtiero Filippini, Bologna, all of Italy, assignors to G.D Societa' per Azioni, Bologna, Italy

Filed Nov. 14, 1986, Ser. No. 930,540

Claims priority, application Italy, Dec. 20, 1985, 3652 A/85

Int. Cl.[4] B65B *19/34, 35/50, 47/04*

U.S. Cl. 53—148 **12 Claims**



1. A machine for boxing items in groups, in particular, sticks (3) of sweets, characterised by the fact that it comprises a combination of at least one pocket member (23) open at the top and bottom and designed to receive a neatly arranged group (2) of the said items (3); a supporting plate (24, 25) arranged substantially contacting the open bottom end of the said pocket member (23); mobile supporting means (18) for moving the said pocket member (23), along the said plate (24), between two positions wherein the said group (2) of items (3) is loaded and boxed respectively; feeding means (8) located in the said loading position and designed to form a said group (2) of items (3) inside the said pocket member (23) and on the said supporting plate (24, 25); a cardboard blank (37) feeding assembly (42) for successively feeding cardboard blanks (37) onto the said plate (24) in the said boxing position, the said plate (24) presenting an opening (29) in the said boxing position; mobile retaining means (36) for securing each blank (37) on the said plate (24) in such a position as to cover the said opening (29); a tubular bending assembly (57) designed to move through the said opening (29) and having an inner passage of substantially the same section as the said group (2) of items (3); and pushing means (31, 33) located in the said boxing position, for forcing the said group (2) of items (3) and the respective cardboard blank (37) through the said pocket member (23), the said bending assembly (57) and the said opening (29), so as to transfer the said group (2) of items (3) from the said boxing position to an unloading position underneath the said plate (24).

4,693,052

APPARATUS FOR ASEPTIC PACKAGING

Manfred Rebmann, Weinstadt; Otto Rothermel, Stuttgart, and Willi Stirnkorb, Waiblingen-Hegnach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 17, 1986, Ser. No. 942,645

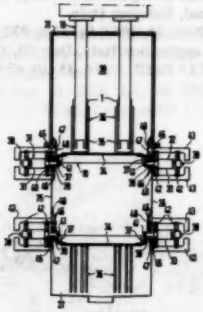
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1986, 3607322

Int. Cl.[4] B65B *55/02*

U.S. Cl. 53—167 **9 Claims**

1. An apparatus for aseptic packaging of products comprising a clean room containing a sterile atmosphere at overpres-

sure, said clean room uncompassed by top, bottom, side and oppositely disposed end walls, said end walls arranged to receive through restrictive apertures upper and lower conveyor flights, endless conveying means provided with chain link holder means mounted exteriorly of each of said side walls of said clean room adapted to communicate by said chain link



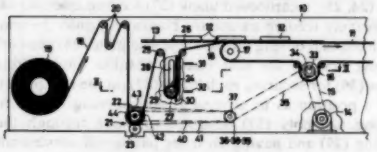
holder means which extend through oppositely disposed slit means in said side walls of said clean room with said conveyor flights and labyrinth seal means disposed interiorally of each of said side walls of said clean room with said labyrinth seal means disposed between said upper and lower conveyor flights and said conveyor means.

4,693,053

DEVICE FOR CONTROLLING THE UNWINDING OF A PLASTICS FILM IN A PACKAGING MACHINE

Aris Ballestrazzi, and Lamberto Tassi, both of Savignano sul Panaro, Italy, assignors to SITMA Societa Italiana Macchine Automatiche S.p.A., Spilamberto, Italy

Filed Jun. 18, 1986, Ser. No. 875,537
Claims priority, application Italy, Jun. 26, 1985, 22272/85[U]
Int. Cl.[4] B65B *41/12*
U.S. Cl. 53—389 **2 Claims**



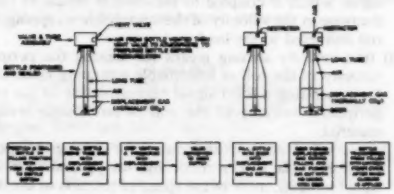
1. A device for controlling the unwinding of a plastics film from a reel in a packaging machine comprising a conveyor belt for the products to be packaged and a variable speed motor for driving said conveyor belt by means of a drive roller, characterised in that said film, between the point at which it unwinds from the reel and the point at which it makes contact with said conveyor belt, passes in succession at least through a pair of dragging rollers and about a floating cylindrical bar disposed between two fixed film guide rollers, and in that the drive roller of said pair of dragging rollers receives its motion from the conveyor belt drive roller, driven by said variable speed motor, by way of a linkage comprising two alternately activated transmissions of different ratios, one ratio being such that the linear film unwinding speed induced by said pair of dragging rollers is slightly less than the linear speed of advancement of the conveyor belt, the other ratio being such that the linear film unwinding speed is slightly greater than the linear speed of said belt, said floating bar cooperating with twol microswitches which are vertically superposed at two different levels and arranged to activate respectively one and the other of said transmissions when the floating bar reaches the levels of the relative microswitches during its vertical reciprocating motion.

4,693,054

PROCESS FOR FILLING BEER INTO CONTAINERS

William G. Spargo, St. Louis, Mo., assignor to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed Nov. 6, 1984, Ser. No. 668,639
Int. Cl.[4] B65B *31/00*
U.S. Cl. 53—432 **5 Claims**



1. The method of filling containers with a carbonated beverage which comprises the steps of:

(a) positioning a container having an open top and an interior bottom therebelow, filled with air at atmospheric pressure, in a fixed, sealed position relative to a filling head having tube means of large diameter extending downwardly from the filling head into the container so that the bottom end of the filling tube means is at a fixed height closely adjacent to and directed toward the interior bottom of the container, the filling head having a source of substantially oxygen free gas which is at a predetermined pressure greater than atmospheric and a source of beverage which is substantially at the said predetermined pressure;

(b) prepurging the container by flowing substantially oxygen free gas from the source thereof through the filling tube means while venting the upper end of the container through valve means to ambient atmosphere so that the substantially oxygen free gas is directed at low velocity toward the bottom of the container while the container is in the position of step "a" until a substantially pure blanket of the substantially oxygen free gas has grown in thickness from the bottom to a level above the fixed height of the bottom end of the filling tube, has displaced the air in the container upwardly above the fixed height, and has forced air outwardly to ambient atmosphere through the vent valve;

(c) terminating the valved venting of the interior of the container while continuing the flowing of the substantially oxygen free gas from the source thereof until the interior of the container is substantially at the predetermined pressure of the source of the substantially oxygen free gas;

(d) discontinuing the flowing of the substantially oxygen free gas from the source thereof, thereafter flowing the beverage from its source through the tube means into the bottom of the container while restricting flow of air from the container to control the flow rate of the beverage into the container so that the beverage is filled into an environment of the relatively pure blanket of the oxygen free gas to limit the amount of exposure of the beverage to oxygen and limit the air/oxygen pickup of the beverage while maintaining the predetermined pressure within the container; and

(e) terminating the flow of the beverage into the container when it is filled, separating the filling head from the container, and then closing the container.

4,693,055

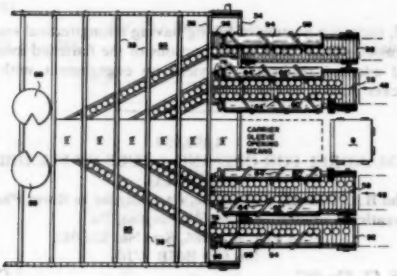
METHOD AND APPARATUS FOR FEEDING CONTAINERS TO A CARRIER SLEEVE

Peter C. Olsen, Jr.; Peter M. Conforto, both of Monroe, La.; David L. Wolf, Cedar Falls, Iowa, and Donald R. Hudson, West Monroe, La., assignors to Manville Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 861,774, May 9, 1986, abandoned. This application Oct. 6, 1986, Ser. No. 915,479

Int. Cl.[4] B65B *21/06*

U.S. Cl. 53—443 28 Claims



1. Apparatus for feeding containers, a substantial portion of each container being cylindrical is shape, to an open-ended carrier sleeve moving in a downstream direction along a support surface, comprising:

conveyor means for moving the containers downstream in a row on either side of an generally parallel to the direction of movement of the carrier sleeves,

container support means aligned with and spaced downstream from the conveyor means for continuing the movement of the containers,

screw means mounted parallel to and extending along substantial portions of the conveyor means so as to engage the containers and separate them into groups containing a predetermined number of containers while the containers are being moved by the conveyor means,

a flight bar conveyor having an upward run which moves the flight bars through the space between the downstream end of the conveyor means and the upstream end of the container support means, and a generally horizontal run which moves the flight bars downstream vertically spaced above the container support means, the flight bar contacting containers on the container support means and pushing them along the container support means during the generally horizontal run of the flight bar conveyor,

means for holding an open-ended carrier sleeve in the pocket formed by successive flight bars during the generally horizontal run of the flight bar conveyor, and

means for moving the containers into the carrier sleeves through the open ends thereof.

20. A method of feeding containers, a substantial portion of each container being cylindrical in shape, to an open-ended carrier sleeve moving in a downstream direction along a support surface, comprising the steps of:

moving open-ended carrier sleeves in the pockets formed by successive flight bars of a flight bar conveyor during the downstream run of the flight bar conveyor,

moving the containers in a row on conveyor means located upstream from the flight bar conveyor and on either side of and generally parallel to the direction of movement of the carrier sleeves,

contacting the containers with screw means to separate the containers into groups of a predetermined number while the containers are being moved by the conveyor means,

moving the flight bars upwardly to the downstream ends of the conveyor means just prior to the downstream run of the flight bar conveyor,

contacting the last container in each group of containers with a flight bar substantially as the flight bar is changing direction from the upward run thereof to the downstream run thereof,

moving the containers on support means spaced downstream from the conveyor means a distance allowing the flight bars to move up between the conveyor means and the support means and to move downstream vertically spaced above the support means,

pushing the groups of containers by means of the flight bars past the support means along a support surface, and

moving the groups of containers into the carrier sleeves through the open ends thereof.

4,693,056

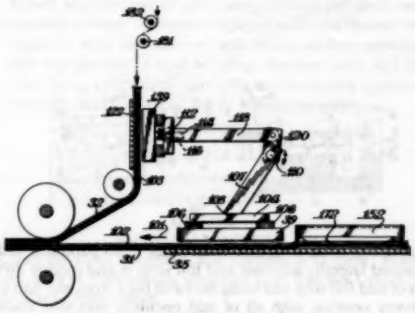
HEAT SEALING AND PACKAGING

Lewis R. Raszewski, Stevensville, Md., assignor to The Crowell Corporation, Newport, Del.

Filed Oct. 4, 1985, Ser. No. 783,430

Int. Cl.[4] B65B *9/02, 23/00*

U.S. Cl. 53—450 8 Claims



1. In the process of packaging articles between two elongated wrapping laminates each having a layer of antistat foam laminated to a backing web and the foam layer of one laminate is heat sealed to the foam layer of the other laminate while the elongated laminates are advanced by side edge rollers through a heat sealing zone as articles to be heat sealed are sandwiched between them, the improvement according to which the laminates are prepared for the heat sealing by melting the foam at the side edges of both laminates at their heat sealing sites, and the laminates with the melted foam edges are pressed together to heat seal them together after an article is sandwiched between them.

4,693,057

APPARATUS FOR ORDERING AND FEEDING A SMALL ITEM LIKE A TABLET, CAPSULE, PILL OR DRAGEE IN A PACKAGING MACHINE

Herbert Rittinger; Detlev H. Gertitschke, both of Laupheim; Karlheinz Rapp, Mittelbiberach, and Bernd Eberle, Laupheim, all of Fed. Rep. of Germany, assignors to Josef Uhlmann Maschinenfabrik GmbH & Co. KG, Laupheim, Fed. Rep. of Germany

Filed Nov. 24, 1986, Ser. No. 934,251

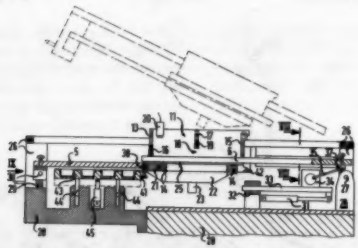
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1985, 3541672

Int. Cl.[4] B65B *35/30, 5/08*

U.S. Cl. 53—539 14 Claims

1. In an apparatus for feeding and depositing a small item to be packaged like a tablet, capsule, pill or the like in a packaging machine into a plurality of upwardly open cups in a foil strip to package said small item, especially in a deep drawn foil strip,

said apparatus comprising a feed slider and a distributing slider movable substantailly parallel to said foil strip positioned above said foil strip over each other, of which the upper one of said sliders movable transverse to the feed direction of said foil strip is said feed slider and is provided with a plurality of openings each dimensioned for receiving and passing only one of said small items and arranged in a pattern like said cups and of which the lower one of said sliders movable parallel to said feed direction of said foil strip is said distributing slider and is provided with a plurality of holes for the passage of said small items from said openings into said cups, wherein said sliders are slidable into a delivery position in which said openings coincide with said holes and with said cups and at least one of said sliders is slidable into a closed position in which said distributing slider secures said openings in said feed slider underneath against said passage of said small items, the improvement wherein said distributing slider is movable into said closed position and said holes are interrupted in the sliding direction of said distributing slider by a plurality of cross members which are oriented longitudinally in the sliding direction of said feed slider and in said closed postion of said distributing slider are under said openings of said feed slider movable into said delivery position, said feed slider forming the bottom of a



loading box filled with said small items in no particular order provided laterally adjacent said foil strip in said motion direction of said foil strip and being movable back from and into said delivery position with all of said openings into said loading box, further said loading box being closed in the direction of said foil strip on the top side of said feed slider for said small items by a skimmer strip and being provided with a lower base under said feed slider which extends under said loading box to said distributing slider and secures said openings of said feed slider from said distributing slider from below against said passage of said small items as well as aligns with said cross members of said distributing slider and forms a sliding path for said small pieces with said openings of said feed slider during motion of said feed slider, said small pieces in said openings on said lower base being substantially completely shut off with said upper side of said feed slider and said feed slider being movable in a quickly alternating fashion, namely vibrating, shaking or the like, in position with said openings inside said loading box for uniform filling of said openings with said small items and said loading box in comparison to said feed motion is of such a size that in said sliding motion none of said openings reach a position under said skimmer strip or a rear wall opposing said skimmer strip.

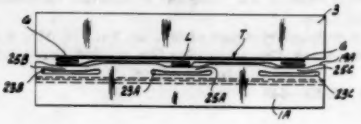
4,693,058

BAG SEALING BAR

Lloyd Kovacs, Sheboygan, Wis., assignor to Hayssen Manufacturing Company, Sheboygan, Wis.

Filed Jul. 17, 1986, Ser. No. 887,559
Int. Cl.[4] B65B *51/26, 51/30, 51/14*
U.S. Cl. 53—552 **14 Claims**

1. A sealing bar for heat sealing a length of heat-sealable material, such as tubing, to form packages and the like, said bar having a metal surface adapted for pressure engagement with the heat-sealable material for flattening it and heating it, said bar having a slot extending substantially therethrough substantially parallel to said surface, said slot being adjacent said surface and defining the portion of the bar between the slot and said surface as a relatively thin resiliently flexible metal bridge which is engageable with a portion of the heat-sealable material, such as a portion of tubing having a longitudinal seam or a gusset, thicker than other portions of the flattened material, and adapted resiliently to yield on engagement with said thicker portion of the material.

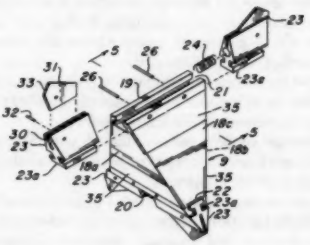


4,693,059

MANDREL FOR OPENING A TUBE OF FLEXIBLE MATERIAL

John B. O'Donnell, Sellersville, Pa., assignor to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Filed Feb. 28, 1986, Ser. No. 835,042
Int. Cl.[4] B65B *9/10*
U.S. Cl. 53—567 **3 Claims**



1. A wedging mandrel for opening a tube of flexible, heat-shrinkable banding material or like tubular material wherein the tubular material is delivered in flat ribbon-like form with creased side edges, said tube opening wedging mandrel comprising first and second sets of planar wedge surface regions, the first and second sets of planar wedge surface regions converging towards and respectively terminating in first and second relatively narrow, elongated, wedge surface portions, the first and second wedge surface portions being disposed at 90° to each other, means for supporting said mandrel with the first of said wedge surface portions being positioned and dimensioned to receive and fit within the tube with the ends of said first wedge surface portion adjacent the creased edges of the tube, feed means for advancing the tube relatively lengthwise of the mandrel whereby the tube is wedged to the opened position, each of said first and second elongated wedge surface portions having a grooved key way extending lengthwise thereof, a pair of relatively moveable wedge-shaped parts mounted on each said first and second elongated surface portion and slidably moveable within the key way on said surface portion, biasing means for yieldably urging each said pair of parts to opposite ends of said elongated wedge surface portion on which said pair of parts is mounted, said parts each having a flat end surface and flat converging wide wall surfaces, the flat converging side and end wall surface of each of said parts being substantially coplanar with the planar surface regions which terminate in and define the elongated surface portion on which the pair of parts is mounted, whereby the pair of parts on the first wedge surface portion resiliently bear against the creased edges of the tube and the pair of parts on the second

wedge surface portion bear against the tube at positions disposed at 90° to the creased edges of the tube.

4,693,060

APPARATUS FOR WRAPPING STACKED GOODS

Peter Born, Reutenstrasse 15, 4800 Zofingen, Switzerland

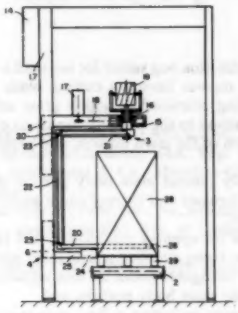
PCT No. PCT/CH84/00181, § 371 Date Jul. 9, 1985, § 102(e) Date Jul. 9, 1985, PCT Pub. No. WO85/02161, PCT Pub. Date May 23, 1985

Continuation of Ser. No. 759,040, Jul. 9, 1985, abandoned. This PCT application Nov. 15, 1984, Ser. No. 931,927

Claims priority, application Switzerland, Nov. 15, 1983, 6125/83

Int. Cl.⁴ B65B *13/04*

U.S. Cl. 53—588 **12 Claims**



1. An apparatus for wrapping a load of goods with a flat band, the band to be passed along a horizontal and vertical path orbiting the load, the apparatus comprising:

a wrapping arm having a horizontal part and a vertical part angled downwards from the horizontal part and attached to the horizontal part, the horizontal part being mounted on a hollow vertical shaft, the vertical shaft being rotatable to carry the vertical part around the load of goods;

a band supply reel mounted above the hollow vertical shaft, the band being fed inside and through the vertical shaft to the horizontal part of the wrapping arm;

guide means for guiding the flat band from the supply reel, the guide means being disposed along the wrapping arm and guiding the flat band along the horizontal part and down the vertical part to a discharge where the band is dispensed onto the load, the guide means including a first band-guiding means mounted at a junction between the horizontal and the vertical parts, the first band-guiding mean being inclined to the shaft thereby to guide the band around an angle between the horizontal and the vertical parts;

a band securing device for securing and severing the band, the band securing device being movably positionable adjacent the discharge for the band; and,

elevating means associated and cooperating with the wrapping arm such that the wrapping arm is continuously displaced in height during at least part of the wrapping operation.

4,693,061

IDLER GEAR MOUNTING FOR DISC CUTTERBARS

Earl E. Koch, Mohnton, and Franja F. Voler, New Holland, both of Pa., assignors to New Holland Inc., New Holland, Pa.

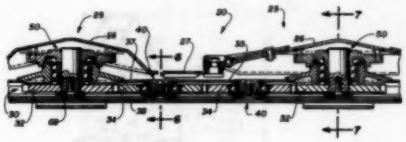
Filed Mar. 31, 1986, Ser. No. 846,651

Int. Cl.⁴ A01D *55/18*

U.S. Cl. 56—13.6 **9 Claims**

1. In a disc cutterbar for severing standing crop material from the ground and having a plurality of disc cutter assemblies rotatably mounted on a transmission casing housing a plurality of intermeshed power transmission gears including a drive gear associated with each respective disc cutter assembly to effect rotation thereof and idler gears positioned between said drive gears to transfer rotational power between said drive gears, each of said idler gears being rotatably mounted within said transmission casing by apparatus extending between an upper surface member and a lower surface member of said casing, an improved idler gear mounting apparatus comprising:

a spacer member positioned within an opening through said transmission casing and engaging said upper surface member, said lower surface member and a bearing rotatably supporting said idler gear on said spacer member;



a fastener extending through said spacer member and having a head portion engaging said spacer member and positioned adjacent one of said casing surface members; and

a securing member releasably engaged with said fastener and engaged with the other of said casing surface members, the engagement of said securing member with said fastener being operable to tightly fix said mounting apparatus between said upper and lower surface members.

4,693,062

MOWING MACHINE

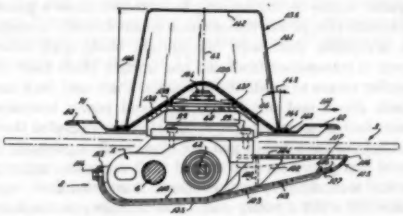
Ir E. van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. Van der Lely N.V., Maasland, Netherlands

Filed Sep. 4, 1985, Ser. No. 772,465

Claims priority, application Netherlands, Jan. 4, 1984, 8400028

Int. Cl.⁴ A01D *34/66*

U.S. Cl. 56—13.6 **24 Claims**



1. A mowing machine comprising a cutter bar having a cutting unit which is rotatable about an upwardly extending rotary axis, a crop engaging member, a body for supporting said crop engaging member, a disc included on the upper face of said cutting unit, at least one cutter mounted on the periphery of said disc, said disc comprising a centrally located upwardly extending conical part and a surrounding annular depression, said body having a bottom plate which closely receives said conical part and includes a lug that is received in said annular depression, and securing means said body being connected to said disc by said securing means so as to be quickly centered thereon and at the same time readily releasable therefrom.

4,693,063

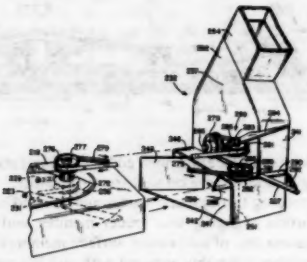
MATERIAL COLLECTION APPARATUS

Thomas L. Hoepfner, 98 Prairiewood Dr., and Keith A. Leistikow, 88 Prairiewood Dr., both of Fargo, N. Dak. 58103

Continuation-in-part of Ser. No. 692,657, Jan. 17, 1985, Pat. No. 4,614,080, which is a continuation-in-part of Ser. No. 557,233, Dec. 1, 1983, abandoned. This application Aug. 18, 1986, Ser. No. 897,329

Int. Cl.[4] A01D *34/63, 87/10*

U.S. Cl. 56—16.6 40 Claims



1. An apparatus for cutting grass and collecting grass clippings comprising: a tractor having an internal combustion engine, a rotary lawn mower having a generally horizontal deck mounted on the tractor, said deck having a grass clipping side discharge section having a discharge opening, a plurality of grass cutting blades located under said deck, means including upright blade shafts rotatably mounting the blades on the deck, drive means for transmitting power from the tractor engine to the blade shafts to rotate the blades whereby the blades cut grass under said deck and move grass clippings through said discharge opening, grass clippings collector means mounted on the tractor, and blower means for receiving grass clippings from said discharge opening and moving the grass clippings to the collector means, said blower means having housing with an internal chamber and an inlet opening aligned with the discharge opening, impeller means located within said chamber, a horizontal shaft rotatably mounting the impeller means on the housing for rotation about a generally horizontal axis, power transmission means drivably connecting the horizontal shaft with one upright blade shaft whereby power is transmitted from said one upright blade shaft to the impeller means to rotate the horizontal shaft, said deck having a hole above said one blade shaft, said power transmission means including an upright shaft extension extended through said hole and secured to said one blade shaft, a generally horizontal first pulley secured to said shaft extension, a generally vertical second pulley secured to said horizontal shaft, support means for a third pulley and a fourth pulley secured to the housing, post means rotatably mounting the third pulley on the support means for rotation about a generally upright first axis, means rotatably mounting the fourth pulley on the support means for rotation about a generally upright second axis, said third and fourth pulleys having outer belt accommodating portions generally aligned with the plane of rotation of the second pulley, and a single endless belt trained about said first and second pulleys and engageable with said third and fourth pulleys whereby said third and fourth pulleys change the orientation of the belt from horizontal to vertical and back to horizontal as the belt travels about said first and second pulleys whereby said belt transmits power from the first pulley to the second pulley to rotate the impeller means concurrently with the rotation of the blades.

4,693,064

GRASS COLLECTION BAG FOR LAWN MOWER

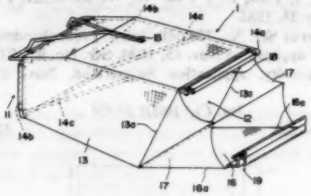
Takao Katayama, Sennan, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed Dec. 5, 1986, Ser. No. 938,694

Claims priority, application Japan, May 2, 1986, 61-102717

Int. Cl.[4] A01D *34/70*

U.S. Cl. 56—202 5 Claims



1. A grass collection bag suited for use with a walking operator type lawn mower having a cutting blade and a steering handle extending rearwardly, which grass collection bag is removably attached to the steering handle to extend in a fore-and-aft direction of the lawn mower, said grass collection bag comprising;

a substantially tubular main body portion defining a grass inlet at a forward end thereof and a grass outlet at a rear end thereof,

a lid member for opening and closing said grass outlet, said lid member being attached to said main body portion to be vertically swingable about an axis adjacent a lower rear edge of said main body portion, and

engaging means including a first engagement member attached to said main body portion adjacent an upper rear edge thereof and a second engagement member attached to said lid member adjacent a free end edge thereof, one of said first and second engagement members defining a slit vertically directed when in an engaged position, and the other of said first and second engagement members defining a projection engageable with said slit, whereby said first and second engagement members are releasably engageable with each other.

4,693,065

FARM MACHINES HAVING FLEXIBLE SKIRTS FOR MOVING AGRICULTURAL PRODUCTS ON THE GROUND

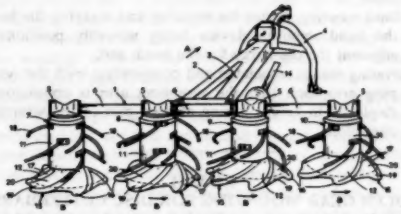
Jerome Aron, Bouxwiller, and Alfred Engel, Saverne, both of France, assignors to Kuhn S.A., Cedex, France

Filed Feb. 6, 1986, Ser. No. 826,815

Claims priority, application France, Feb. 6, 1985, 85 01747

Int. Cl.[4] A01D *80/00, 84/00*

U.S. Cl. 56—377 10 Claims



1. A farm machine comprising:

(a) a frame;

(b) at least one rotor mounted on said frame; and

(c) a resilient flexible skirt at least generally in the shape of a hollow truncated cone for moving products that are on

the ground mounted on said at least one rotor, said flexible skirt comprising a first zone and a second zone, said first zone:

(i) having a thickness which is greater than the thickness of said second zone;

(ii) being integrally formed as a part of said flexible skirt;

(iii) extending without interruption over the entire periphery of said flexible skirt;

(iv) extending to the outside edge of said flexible skirt; and

(v) projecting downwardly beyond said second zone on the lower side of said flexible skirt.

4,693,066

COMPRESSED AIR THREAD SPLICING DEVICE

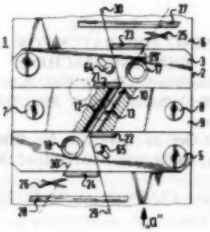
Dieter Oellers, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed May 21, 1986, Ser. No. 866,059

Claims priority, application Fed. Rep. of Germany, May 22, 1985, 3518315

Int. Cl.[4] **D01H** *15/00*; **B65H** *69/06*; **D02J** *1/08*

U.S. Cl. 57—22 **2 Claims**



1. Compressed air thread splicing device for producing a thread connection by splicing, comprising a splicing chamber having at least one opening formed therein through which compressed air is blown into said splicing chamber for mutually entangling, hooking, intermingling and winding fibers of threads to be spliced together in said splicing chamber, pneumatic holding devices disposed at two sides of said splicing chamber for holding ends of the threads to be prepared for splicing at a given location between said pneumatic holding devices and said splicing chamber, each of said holding devices having a channel for receiving a thread end and a lateral opening for receiving injection air generating a holding air current, a slider having flow channels with ends formed therein for each of said holding devices pointing in different discharge directions, said ends of said flow channels and said lateral openings being disposed substantially vertically below said given location, a compressed air supply channel, and means for alternately conducting the injection air through said flow channels to said lateral opening for determining the discharge direction of the injection air, said injection air conducting means being in the form of means for shifting said slider between a first position in which one of said flow channels is connected to said compressed air supply channel and a second position in which the other of said flow channels is connected to said compressed air supply channel.

4,693,067

MIXING HEAD FOR EQUIPMENT FOR JOINING TEXTILE THREADS WITH THE AID OF COMPRESSED AIR

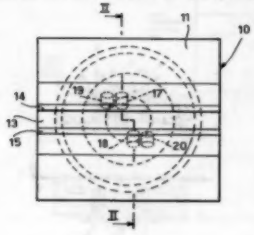
Lorenzo Locatelli, Toscolano, Italy, assignor to Mesdan S.p.A., Salo' , Italy

Filed Sep. 9, 1986, Ser. No. 906,267

Claims priority, application Italy, Sep. 11, 1985, 22978/85[U]

Int. Cl.[4] **B65H** *69/06*; **D01H** *15/00*

U.S. Cl. 57—22 **2 Claims**



1. A mixing head for joining textile threads with the aid of compressed air, comprising:

a body having a cylindrical chamber which is open at each end, said chamber having along its longitudinal length an open slot closable by a removable cover; and

a first pair of cylindrical duct means for channeling compressed air into said chamber, the ratio of the cross-sectional area of said cylindrical chamber to the sum of the cross-sectional areas of said cylindrical duct means being in the range of 1.8 to 2.5, said ducts being arranged such that at least one duct is arranged on each side of said cylindrical chamber relative to the cylindrical chamber's longitudinal plane of symmetry; and

wherein said cylindrical ducts are further arranged to be spaced in the longitudinal diection on each side of the median transverse plane of said cylindrical chamber a distance not exceeding one half the diameter of said cylindrical ducts; and

a second pair of cylindrical ducts parallel to and spaced from said first pair of ducts towards the respective open ends of said cylindrical chamber by a distance not exceeding one half the diameter of said second pair of ducts; and

said first and second pairs of ducts being further arranged such that their respective axes of alignment intersect the cylindrical chamber's longitudinal plane of symmetry at an angle in the range of 15° to 32°.

4,693,068

THREAD SLACKENING DEVICE

Carlos Matas Gabalda, Granges les Valence, France, assignor to I.C. ACBF, France

Filed Jun. 5, 1986, Ser. No. 870,998

Claims priority, application France, Jun. 11, 1985, 85 08987

Int. Cl.[4] **D01H** *13/10*; **B65H** *59/00*

U.S. Cl. 57—58.86 **4 Claims**

1. A thread slackening device comprising:

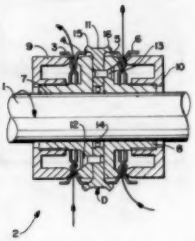
a rotary shaft;

a first hub and a second hub carried by said rotary shaft and being rotatable therewith, each of said hubs having an inner end and an outer end, the inner end of said first hub being juxtaposed with the inner end of said second hub;

a cylindrical track located adjacent the inner ends of said first and second hubs and extending around said rotary shaft, said cylindrical track being fixedly secured to at least one of said hubs;

a first nut mounted on the outer end of said first hub and a second nut mounted on the outer end of said second hub, said nuts being axially movable relative to said hubs; and

first and second pairs of cups mounted on opposite sides of said cylindrical track, said first pair of cups extending radial outwardly from said first hub, terminating in free outer ends which form a first lateral rim, and being carried by said first hub such that the cups are held in position against one another by said first nut to form a first side track, and said second pair of cups extending radially outwardly from said second hub, terminating in free outer ends which form a second lateral rim, and being carried by said second hub such that the cups are held in position against one another by said second nut to form a second side track;



wherein an external diameter of said cylindrical track is at least equal to a diameter of said first side track and at least equal to a diameter of said second side track;

wherein tension communicated to a thread passing between either of said pairs of cup can be varied by axially moving the respective nut to change the pressure exerted upon the cups; and

wherein the thread is in contact with said cylindrical track during a throwing operation and is pushed back onto one of said side tracks after being thrown.

4,693,069

DOUBLING MACHINE

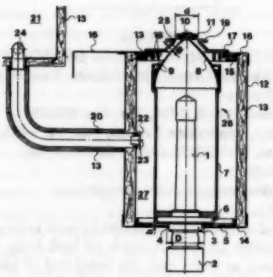
Christian Imhof, Oerlingen, and Gerhard Kempf, Arbon, both of Switzerland, assignors to Sulzer Brothers Ltd., Winterthur and Carl Hamel Spinn-& Zwirnmaschine AG, Arbon, both of, Switzerland

Filed Sep. 3, 1986, Ser. No. 903,552

Claims priority, application Switzerland, Sep. 13, 1985, 3963/85

Int. Cl.[4] D01H *1/16, 7/18, 13/28*

U.S. Cl. 57—59 **12 Claims**



1. In combination,

a spindle for receiving a feed bobbin;

a wharve having a flange for mounting of said spindle thereon;

a stationary heat insulating jacket disposed concentrically about said spindle to define a chamber;

a bottom closure member peripherally secured to said jacket and spaced from said flange to define a first passage therebetween for a flow of air;

a can mounted on said spindle and said flange and disposed within said jacket;

a top closure member peripherally secured to said jacket and spaced from an upper end of said can to define a second passage therebetween for a flow of air;

an air extraction line connected to said jacket and communicating with said chamber centrally of said closure members to exhaust air therefrom; and

wherein said passages are sized relative to each other to equalize the pressure of air drawn through said passages into said chamber during rotation of said can.

6. In combination

a spindle for receiving a feed bobbin;

a wharve having a flange for mounting of said spindle thereon;

a stationary heat insulating jacket disposed concentrically about said spindle to define a chamber having one end at said wharve and a second opposite end;

a can mounted on said spindle and said flange and disposed within said jacket;

an air extraction line connected to said jacket and communicating with said chamber centrally thereof; and

means for drawing air into said chamber at each end at substantially equal pressure for cooling of said can and to maintain a substantially equal temperature over the height of said can.

4,693,070

THREAD JOINING APPARATUS FOR AN OPEN END SPINNING MACHINE

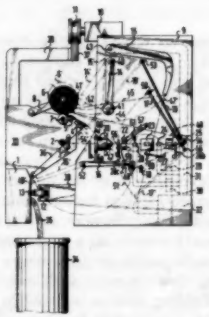
Hans Raasch, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Oct. 15, 1986, Ser. No. 919,198

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1985, 3536910

Int. Cl.[4] D01H *15/00, 13/22*

U.S. Cl. 57—263 **5 Claims**



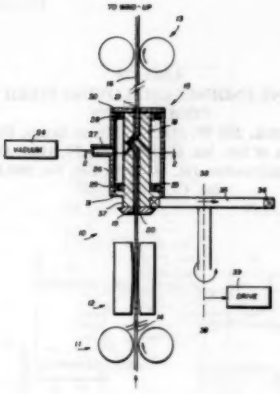
1. Automatic thread joining apparatus for an open end spinning machine, comprising a device for producing a tension-proof thread connection forming a thread joint, a device for removing the thread joint, a controllable thread storage device for intermediate storage of a length of thread spun during operation of said device for producing a tension-proof thread connection, a thread removal device associated with said thread storage device, and means for activating said thread removal device upon the occurrence of an unsuccessful thread connecting operation.

4,693,071

VACUUM TEXTURIZING PROCESS

Elbert F. Morrison, Clarksville, Va., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Dec. 20, 1985, Ser. No. 811,747
Int. Cl.[4] D02G *1/02, 1/04, 1/16*
U.S. Cl. 57—289 17 Claims



1. Yarn texturizing apparatus comprising:
feed means for feeding yarn to be texturized;
a heater block;
a spindle comprising a perforated cylinder having a generally axially through-extending passageway;
means for mounting said spindle for rotation about an axis generally coincident with said axial passageway;
means for rotating said cylinder about said axis;
means for applying a vacuum to the exterior of said perforated cylinder such that the yarn is held by the vacuum against an inner wall of the cylinder passageway;
output means from said cylinder for withdrawing texturized yarn from said cylinder;
said feed means, heater block, and spindle mounted with respect to each other so that during operation feed yarn passes through said feed means to said heater block, and then to said spindle, and finally to said output means.

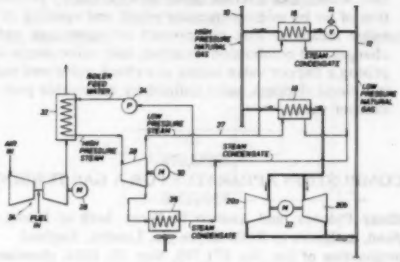
13. A method of texturizing a yarn utilizing a heater block, a spindle comprising a perforated cylinder with a generally axially through-extending passageway, and a source of vacuum, comprising the steps of:
(a) feeding yarn to be texturized through the heater block, in operative contact therewith, to the perforated cylinder generally axially extending passageway;
(b) imparting twist to the yarn in the cylinder, which twist is backed up to the heater block wherein the twist is set in a semi-permanent, false twist configuration; and
(c) removing the yarn from the cylinder at which time the twist relieves itself and a textured, bulk, stretch-type yarn is produced; and
wherein step (b) is practiced by rotating the spindle while applying vacuum to the exterior thereof so that the yarn is held by the force of the vacuum against the inner wall of the cylinder, and the rotation thereof imparts twist to the yarn.

4,693,072

METHOD OF OPERATING A COMBINED CYCLE ELECTRIC POWER PLANT

George S. McLean, La Jolla, Calif.; Paul J. Grimes, Katy, Tex., and Albert van Gucht, Dendermonde, Belgium, assignors to Acec Power Systems Limited, Houston, Tex.

Filed Aug. 25, 1986, Ser. No. 899,732
Int. Cl.[4] F02C *3/22*
U.S. Cl. 60—39.02 7 Claims



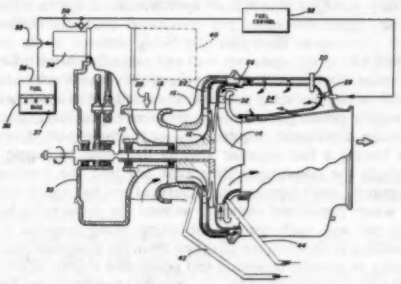
1. A method of generating electricity where gas from a high pressure gas transmission line is being delivered to a lower pressure line, such as a gas distribution system, comprising the steps of supplying a portion of the gas to the combustion chamber of a gas turbine to drive a first electrical generator and produce electricity, using the hot gases in the exhaust of the gas turbine to heat water in a boiler and produce steam, supplying the steam to a steam turbine to drive a second electrical generator and produce electricity, reducing the pressure of the gas being delivered to the pressure of the low pressure line, and using the heat of condensation of the exhaust steam from the steam turbine to keep the temperature of the gas at or above a selected minimum as the pressure of the gas is reduced from that of the high pressure line to the pressure of the lower pressure line.

4,693,073

METHOD AND APPARATUS FOR STARTING A GAS TURBINE ENGINE

Ronald Blackburn, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed May 27, 1986, Ser. No. 886,741
Int. Cl.[4] F02C *7/268*
U.S. Cl. 60—39.02 4 Claims



1. A gas turbine engine comprising:
a rotatable compressor wheel;
a rotatable turbine wheel;
means coupling said wheels for conjoint rotation;
a combustion chamber having an air inlet disposed to receive compressed air from said compressor wheel, a fuel inlet

for receipt of fuel to be oxidized, and a combustion gas outlet disposed to provide combustion gas under pressure to said turbine wheel to rotate the same;

valve means between said compressor wheel and said combustion chamber to said compressor wheel; and

means for starting said engine including means for periodically injecting and combusting fuel in said chamber so as to create a pressurized gas therein and thereafter halting the injecting and combustion of fuel in the chamber so as to allow the pressurized gas to expand through said turbine wheel to accelerate the same followed by pressurization of air by said compressor wheel and opening of said valve means so that compressed air scavenges and recharges said combustion chamber, said valve means comprising a flapper valve acting as a check valve and including plural flappers, each defined by a movable part of a diffuser vane.

4,693,074

COMBUSTION APPARATUS FOR A GAS TURBINE ENGINE

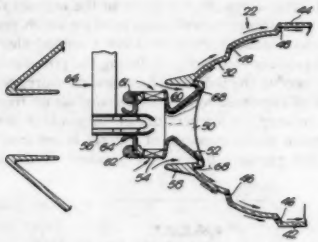
Anthony Pidcock, and Andrew P. Wray, both of Derby, England, assignors to Rolls-Royce plc, London, England

Continuation of Ser. No. 671,785, Nov. 15, 1984, abandoned. This application May 16, 1986, Ser. No. 865,648

Claims priority, application United Kingdom, Nov. 26, 1983, 8331634

Int. Cl.[4] F02C *1/00*; F02G *3/00*

U.S. Cl. 60—39.32 **16 Claims**



1. Annular combustion equipment for a gas turbine engine comprising an inner annular wall, an outer annular wall and an upstream wall, the upstream wall comprising a single skin and forming part of a dump diffuser, the upstream wall being convectively cooled by cooling and dilution air supplied from the dump diffuser passing over the upstream surface of the upstream wall, the upstream wall having a plurality of circumferentially arranged equi-spaced apertures, each aperture having a convergent/divergent pot positioned coaxially therewith, each convergent/divergent pot being secured at its downstream end to the upstream wall and extending in an upstream direction therefrom, each convergent/divergent pot having a radial swirler assembly positioned coaxially at its upstream end to supply primary air through the convergent/divergent pot into the combustion equipment, each convergent/divergent pot having a fuel injector aligned therewith to supply fuel through the convergent/divergent pot into the combustion equipment, each convergent/divergent pot having an annular air scoop positioned coaxially around the convergent/divergent pot and each annular air scoop being secured to and extending in an upstream direction from the upstream wall, and having an annular upstream end positioned axially adjacent to said radial swirler assembly, an annular chamber being formed between each convergent/divergent pot and the corresponding annular air scoop, each convergent/divergent pot having a plurality of apertures arranged in a ring at its downstream end for supplying cooling air from the annular chamber over the downstream face of the upstream wall, each annular air scoop supplying primary air to the radial swirler assembly of the respective convergent/divergent pot and cooling air to the respective annular chamber, a plurality of said annular air scoops being provided in a circumferentially spaced relation to each other such that the upstream wall between adjacent air scoops is convectively cooled by cooling and dilution air passing over the upstream surface of the upstream wall.

4,693,075

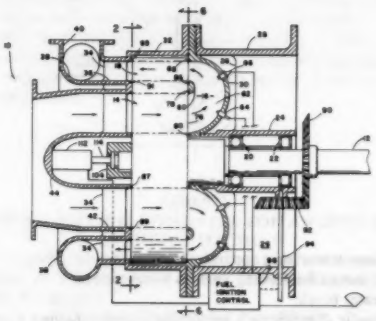
GAS TURBINE ENGINES EMPLOYING FIXED VOLUME COMBUSTION

Andrew Sabatiuk, 336 W. 31st St., Miami Beach, Fla. 33140

Continuation of Ser. No. 666,773, Oct. 31, 1984, abandoned. This application Jul. 16, 1986, Ser. No. 884,862

Int. Cl.[4] F02C *5/00*

U.S. Cl. 60—39.39 **14 Claims**



1. A gas turbine engine comprising, in series flow relation, an inducer, a combustor into which air is charged by the inducer and in which hot gases are generated, and a turbine rotatably driven by said hot gases, said inducer and turbine being interconnected so that the inducer is driven by the turbine, said turbine and inducer comprising an engine rotor, said engine rotor being rotatable about a common axis, relative to the combustor, said engine rotor further comprising a power output shaft for delivering rotative power to a device to be driven thereby,

said combustor comprising a plurality of circumferentially spaced chambers, each having an entrance and an exit,

said inducer having a radial surface in sealing relation with the combustion chamber entrances and an air flow passageway terminating in a discharge port opening onto said radial surface,

said turbine having a radial surface in sealing relation with the combustion chamber exits and an expansion passageway having an inlet port opening from said radial surface,

said inducer discharge port and said turbine inlet port being successively registerable with the entrances and exits of different combustion chambers, as the inducer and turbine rotate, and as both the entrance and exit of at least one chamber are sealed, and further comprising

operating means including means for introducing fuel into said chambers and means for igniting the fuel in successive chambers when both ends are sealed, characterized in that the igniting means ignites the fuel in less than the total number of combustion chambers during each cycle of engine rotor rotation.

4,693,076

DOUBLE AIR-FUEL RATIO SENSOR SYSTEM HAVING IMPROVED RESPONSE CHARACTERISTICS

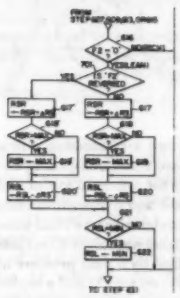
Yoshiki Chujo, Mishima; Nobuaki Kayanuma, Gotenba; Hironori Bessho, Susono; Takatoshi Masui, Mishima; Toshinari Nagai, Susono; Toshiyasu Katsuno, Susono, and Toshio Tanahashi, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

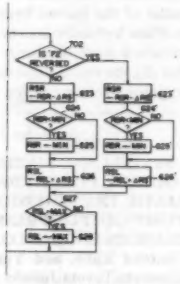
Filed Apr. 7, 1986, Ser. No. 848,580

Claims priority, application Japan, Apr. 9, 1985, 60-73555; Apr. 10, 1985, 60-74439; Sep. 11, 1985, 60-199337

Int. Cl.[4] F02D *41/14*

U.S. Cl. 60—274 **36 Claims**





1. A method for controlling the air-fuel ratio in an internal combustion engine having a catalyst converter for removing pollutants in the exhaust gas thereof, and upstream-side and downstream-side air-fuel ratio sensors disposed upstream and downstream, respectively, of said catalyst converter for detecting the concentration of a specific component in the exhaust gas, comprising the steps of:

comparing the output of said upstream-side air-fuel ratio sensor with a first predetermined reference voltage;

gradually changing an air-fuel ratio correction amount in accordance with the comparison result of the output of said upstream-side air-fuel ratio sensor;

skipping up said air-fuel ratio correction amount by a rich skip amount when the comparison result of said air-fuel ratio sensor is switched from the lean side to the rich side;

skipping down said air-fuel ratio correction amount by a lean skip amount when the comparison result of said air-fuel ratio sensor is switched from the rich side to the lean side;

adjusting an actual air-fuel ratio in accordance with said air-fuel ratio correction amount;

comparing the output of said downstream-side air-fuel ratio sensor with a second predetermined reference voltage; and

changing at least one of said rich and lean skip amounts in accordance with the comparison result of said downstream-side air-fuel ratio sensor.

4,693,077

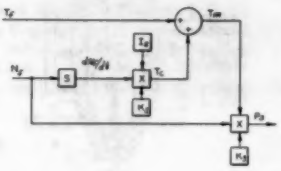
CLOSED-LOOP ENGINE CONTROL WITH FEEDBACK TORQUE ERROR COMPENSATION

Charles A. Skarvan, Indianapolis, and Stephen A. fisher, Whitestown, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 18, 1986, Ser. No. 886,624

Int. Cl.[4] F02C *9/28*

U.S. Cl. 60—39.282 **3 Claims**



1. In a closed-loop system in which an engine is controlled to provide power to a load as a function of measured feedback torque, the improvement comprising:

means for modifying the feedback torque by adding to it a synthesized correction torque provided by the product of the engine polar moment of inertia and the engine acceleration thereby to compensate the system for the phase and amplitude error between the measured feedback torque and the actual gross engine torque caused by the circumstance that the measured feedback torque represents the actual gross engine torque less the torque required to accelerate the engine moment of inertia, whereby the modified feedback torque more nearly represents the actual gross engine torque thereby improving the response and stability of the system.

4,693,078

SOOT AFTERBURNER FOR MOTOR-VEHICLE EXHAUST SYSTEM

Hubert Dettling, Waiblingen; Gottlob Haag, Markgröningen; Karl-Heinz Hägele, Vaihingen/Enz; Rolf Leonhard, Schwieberdingen, and Wilhelm Polach, Möglingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 9, 1985, Ser. No. 807,435

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1985, 3504299

Int. Cl.[4] F01N *3/22, 3/26*

U.S. Cl. 60—295 **10 Claims**

1. An afterburner for clearing soot from a particle-laden gas stream, the afterburner comprising:

a housing centered on an upright axis and having

a generally cylindrical upper portion having a downwardly open lower end, and

a lower portion tapering toward the axis from the lower of the upper portion and having at the axis a downwardly closed lower end;

an exhaust tube opening at the axis into the upper housing portion above the lower end thereof;

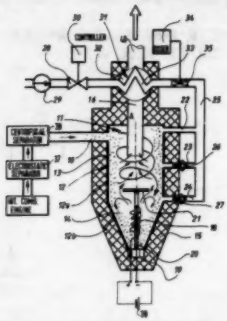
means including a feed tube opening tangentially into the upper housing portion above the lower end thereof for introducing the particle-laden gas stream tangentially into the upper housing portion, whereby the soot particles of the gas stream move inertially radially outward and descend in the housing to collect at the closed lower end of the lower tapering portion;

means including an electrical heating element at the axis the

lower end of the lower tapering portion for burning the soot particles collecting therein;

a plurality of branch conduits having respective inner opening tangentially and at axially spaced locations in the upper portion of the housing and each having a respective outer end;

a feed manifold connected to the outer conduit ends;



means for periodically feeding a combustion-supporting gas under pressure to the feed manifold and thereby injecting the combustion-supporting gas tangentially from the inner ends into the upper housing portion; and

means including a check valve in at least one of the branch conduits and operated for passing the combustion-supporting gas only when it is at a pressure greater than that in the other conduit.

4,693,079

MULTI-PARTITE EXHAUST GAS LINE

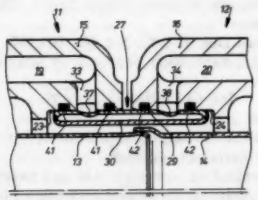
Dieter Wuensche, Friedrichshafen, and Norbert Eisenblaetter, Langenargen, both of Fed. Rep. of Germany, assignors to MTU-Motoren und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany

Filed Nov. 7, 1986, Ser. No. 928,019

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1985, 3539778

Int. Cl.[4] F01N *3/02*

U.S. Cl. 60—320 **11 Claims**



1. A multi-partite exhaust gas line for a piston internal combustion engine in which each exhaust gas line section includes an inner pipe line means conducting the exhaust gases and a housing means surrounding said pipe line means with a spacing and having a cooling liquid space, the housing means of adjacent exhaust gas line sections being connected with each other, a substantially cylindrical recess means being formed in the adjacent ends of the housing means of two exhaust gas line sections, said recess means cooperating with a connecting nipple means, at least one liquid channel being arranged within the walls of the connecting nipple means that has radial openings, said radial openings corresponding with corresponding radial openings of the cooling liquid spaces in the cylindrical recess means of adjacent housing means.

4,693,080

HYDRAULIC CIRCUIT WITH ACCUMULATOR

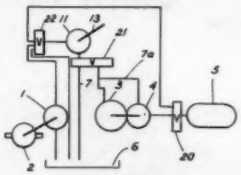
Henricus J. J. M. Van Hooff, Papendrecht, Netherlands, assignor to Van Rietschoten & Houwens Technische Handelmaatschappij B.V., Rotterdam, Netherlands

Filed Sep. 18, 1985, Ser. No. 777,366

Claims priority, application Netherlands, Sep. 21, 1984, 8402899

Int. Cl.[4] F16D *31/02*

U.S. Cl. 60—414 **4 Claims**



1. A hydraulic circuit for actuating a first hydraulic motor with an under pressure fluid, comprising an externally driven first hydraulic pump for introduction of fluid into the circuit from an open reservoir and hydraulic accumulator to keep the introduced body of under pressure fluid stand-by, the pressure in the accumulator being sufficient to actuate the first hydraulic motor, characterized by a fluid pressure intensifier comprising a second hydraulic motor (**3**) and a second hydraulic pump (**4**) coupled therewith, wherein the second hydraulic pump (**4**) has a smaller swept volume than the second hydraulic motor (**3**), and the second hydraulic motor (**3**) is interconnected in a discharge pipe (**7**) connected to an outlet of the first hydraulic pump (**11**) and an outlet of the second hydraulic pump (**4**) is connected to an inlet of the hydraulic accumulator (**5**) to introduce a fluid body obtained from discharge pipe (**7**) into the hydraulic accumulator (**5**), the second hydraulic motor (**3**) and the second hydraulic pump (**4**) being of the rotating type.

4,693,081

CONTROL SYSTEM AND METHOD FOR CONTROLLING OUTPUT TYPE HYDRAULIC FLUID PUMP OF AUTOMATIC TRANSMISSION PROVIDING INCREASED PUMP OUTPUT PRESSURE WITH INCREASE IN ENGINE LOAD

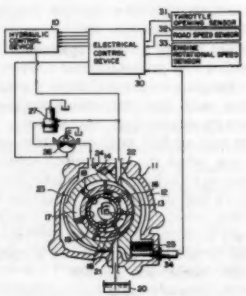
Shinya Nakamura; Seitoku Kubo, and Yutaka Taga, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 8, 1985, Ser. No. 785,404

Claims priority, application Japan, Oct. 8, 1984, 59-210779

Int. Cl.[4] F16D *31/02*

U.S. Cl. 60—448 **24 Claims**



1. A control method for a hydraulic fluid pump comprised in

a hydraulically actuated automatic transmission system for a vehicle driven by an engine, said transmission system having hydraulic means for establishing a speed ratio thereof, said hydraulic means using hydraulic fluid at a line pressure maintained by said hydraulic fluid pump, said method comprising the steps of:

detecting the load on said engine; and:

controlling said hydraulic fluid pump such that an output thereof increases with an increase of said detected value of the load on said engine.

13. In a hydraulically actuated automatic transmission system for a vehicle driven by an engine, said transmission system having hydraulic means for establishing a speed ratio thereof and hydraulic fluid pump means for supplying pressurized hydraulic fluid to said means for establishing at a line pressure, a control system comprising:

means for detecting the load on said engine; and

means for controlling said hydraulic fluid pump such that an output thereof increases with an increase of said detected value of the load on said engine.

4,693,082

METHOD FOR SUPPLYING HEAT TO AN ENGINE FOR EXTERNAL HEAT SUPPLY BY INTERMITTENT COMBUSTION, AND ENGINE FOR CARRYING OUT THE METHOD

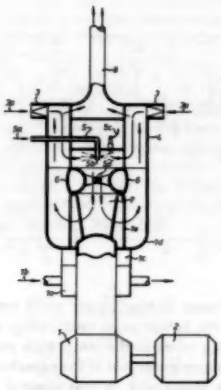
Stig G. Carlqvist, Malmö, Sweden, assignor to Stig G. Carlqvist Motor Consultant, (C.M.C.) Aktiebolag, Malmö, Sweden

Filed Jan. 13, 1986, Ser. No. 818,459

Claims priority, application Sweden, Jan. 14, 1985, 8500149

Int. Cl.[4] F02G *1/04*

U.S. Cl. 60—517 **6 Claims**



1. A combustor and a hot gas engine,

said combustor comprising a combustion chamber, means for producing intermittent combustion of the fuel within the combustion chamber and intermittent motion of gases in the combustion chamber, said combustion producing means including means for supplying combustion air to the combustion chamber and means for supplying fuel to the combustion chamber, said combustor also including an exhaust means which is located downstream of the combustion chamber for receiving exhaust gases from the combustion chamber and emitting them from the combustor,

said hot gas engine comprising a closed thermodynamic system which has a working medium flowing therethrough, said thermodynamic system including a heater, a regenerator and a cooler, said heater being operable to supply heat to the working medium, said heater being positioned in the combustion chamber of the combustion upstream of the exhaust means and having a shape and position which does not interfere with the intermittent combustion or prevent the flow of gases in the combustion chamber.

4,693,083

VACUUM BRAKE FORCE BOOSTER

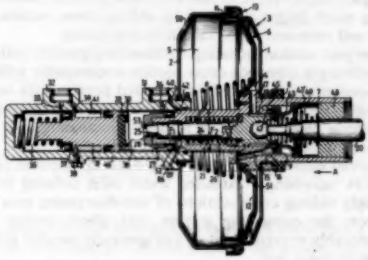
Hans D. Reinartz, Frankfurt am Main, Fed. Rep. of Germany, assignor to ITT Industries Incorporated, New York, N.Y.

Filed Jan. 14, 1985, Ser. No. 691,426

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1984, 3401402

Int. Cl.[4] B60T *13/00*

U.S. Cl. 60—547.1 **7 Claims**



1. A combination vacuum brake booster and master cylinder comprising:

a booster casing;

a moveable wall sealingly subdividing said casing into a low pressure chamber and a working chamber;

a dual valve including a control valve housing affixed to said moveable wall and mounted to said casing for movement with said wall, said control valve housing having a longitudinal bore;

a poppet valve mounted in said longitudinal bore;

a plunger sealingly, slidably mounted in said bore connected to a pedal operated push rod, said plunger including means cooperating with said poppet valve for selectively connecting said working chamber to a vacuum and a higher differential pressure in response to movement of said push rod, an end of said plunger being exposed at an end of said control valve housing;

a master cylinder housing affixed to said booster casing and having a bore closed at one, open at a second end, said end of said control valve housing slidably sealingly received in said open end of said master cylinder bore;

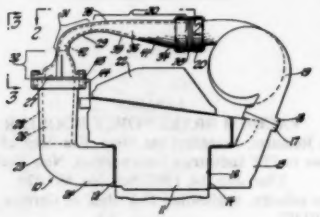
a single free floating master cylinder piston in said master cylinder bore including a rubber reaction member at a first end of said piston facing and being normally spaced apart from said end of said control valve housing, said first end of said master cylinder piston and said end of said control valve housing and said exposed end of said plunger defining a first master cylinder pressure chamber and said closed end of said master cylinder bore and a second end of said master cylinder piston defining a second master cylinder pressure chamber, said end of said control valve housing and said exposed end of said plunger abutting said reaction member upon loss of pressure in said first master cylinder pressure chamber.

4,693,084

CHARGE COOLER ANGLE DUCT

William K. Ahrens, Novi, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 25, 1986, Ser. No. 889,278
Int. Cl.[4] F02B *29/04*
U.S. Cl. 60—599 **8 Claims**



1. A curved angle duct for connection between a member having a compact cross section and a charge cooler connection having much larger area and an oblong cross section with wider and narrower sides, said duct comprising

a compact section including a connecting portion with sides defining a compact cross section connectable with said member and merging into a tapered portion with increasingly wider and narrower sides defining increasingly oblong cross sections of smoothly increasing area away from the connecting portion,

a curved elbow section extending from the tapered portion with increasingly extended wider sides defining increasingly oblong cross sections of non-decreasing area away from the connecting section, said elbow section being smoothly curved about an axis generally parallel with the wider sides, and

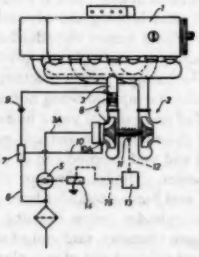
a core attaching section extending away from the elbow section and having oblong cross sections with areas smoothly increasing toward a far end, said core attaching section being defined by wide sides and increasingly extended narrower sides toward the far end, said core attaching section being connectable at its far end with a charge cooler.

4,693,085

DEVICE FOR INCREASING THE ROTATIONAL SPEED OF AN EXHAUST GAS TURBO-CHARGER ON AN INTERNAL COMBUSTION ENGINE

Siegfried Sumser, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 18, 1986, Ser. No. 897,632
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1985, 3529280
Int. Cl.[4] F02B *37/00*
U.S. Cl. 60—611 **7 Claims**



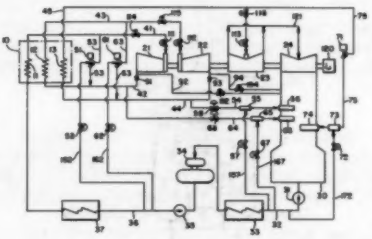
1. Device for increasing the rotational speed of an exhaust gas driven turbo-charger on an internal combustion engine of the type having an air inlet induction duct leading to the engine, a compressor arranged in the induction duct and including a compressor casing defining a compressor inlet duct, and a bypass duct communicating air to said induction duct in bypassing relationship to the compressor, said device comprising an ejector Laval nozzle arranged in the bypass duct and having an annular nozzle shaped induction opening at its constricted throat section surrounded by an annulus which communicates with a connecting duct leading to the compressor inlet duct, whereby flow in said bypass duct effectively evacuates the compressor inlet duct.

4,693,086

STEAM TURBINE PLANT HAVING A TURBINE BYPASS SYSTEM

Shinichi Hoizumi, San Francisco, Calif.; Norio Abe; Takeshi Ueno; Tadao Arakawa, all of Hitachi, and Kunio Hodozuka, Kure, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,106
Claims priority, application Japan, Oct. 15, 1984, 59-214372
Int. Cl.[4] F01K *13/02, 7/24*
U.S. Cl. 60—663 **6 Claims**



1. A reheat steam turbine power plant including a turbine bypass system, the power plant comprising: a boiler having a superheater and a reheater therein, a high pressure steam turbine driven by steam generated in the superheater and supplied through a main steam pipe, a first control valve means for controlling a flow of the steam through the main steam pipe, a reheat steam turbine driven by reheat steam heated up in the reheater and conducted through a hot reheat steam pipe, a second control valve means for controlling a flow of steam through the hot reheat steam pipe, a condenser for condensing the reheat steam exhausted from the reheat steam turbine, a cold reheat steam pipe connecting an outlet of the high pressure steam turbine with an inlet of the reheater, a check valve means disposed in the cold reheat steam pipe, a condensate pipe means for connecting the condenser with an upstream side of the superheater, a high pressure turbine bypass pipe means for connecting the main steam pipe with the cold reheat steam pipe, a turbine bypass valve disposed in said high pressure turbine bypass pipe, and means for reducing the quantity of the reheat steam introduced into the reheater from the superheater through the high pressure turbine bypass pipe means and for discharging an excess steam from the high pressure turbine bypass pipe means and the cold reheat steam pipe when the high pressure turbine bypass means is operated.

4,693,087

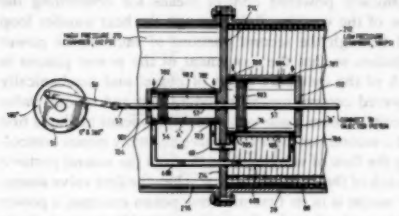
METHOD OF GENERATING POWER FROM A VAPOR

Ralph J. Lagow, Anahuac, Tex., assignor to Thermal Engine Technology, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 664,792, Oct. 25, 1984, Pat. No. 4,603,554. This application Mar. 27, 1986, Ser. No. 844,583

Int. Cl.[4] F01K 11/00

U.S. Cl. 60—670 65 Claims



1. A method of generating power comprising:

heating a working fluid to a superheated vapor;

supplying the superheated vapor to a high pressure zone having a high pressure cylinder and piston operably connected to a working shaft to maintain the high pressure zone at a substantially constant high pressure;

forming an isolated subvolume of working fluid in the high pressure cylinder;

constantly decreasing the subvolume of working fluid in the high pressure cylinder by discharging the subvolume to a low pressure cylinder and piston assembly located in a low pressure zone to constantly increase the subvolume of working fluid in the low pressure cylinder.

4,693,088

COLD TRAP FOR ELIMINATING IMPURITIES FROM A POLLUTED LIQUID METAL

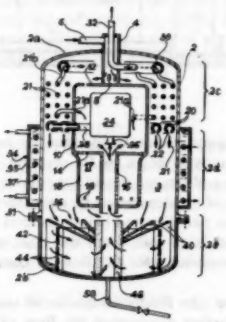
Christian Latge, Aix en Provence, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 30, 1986, Ser. No. 890,480

Claims priority, application France, Aug. 12, 1985, 85 12279

Int. Cl.[4] B01D 8/00

U.S. Cl. 62—55.5 9 Claims



1. A cold trap for eliminating the impurities present in a polluted liquid metal, comprising a body equipped with an admission pipe for the polluted liquid metal and an internal structure defining a path for the metal, said internal structure being successively provided in the direction of flow therethrough with means positioned in said body for cooling the liquid metal so that it can be cooled to a cold point temperature below the impurity saturation temperature for bringing about a crystallization of the impurities, means mounted in said body for receiving liquid metal from said cooling means and for retaining impurities, and a discharge pipe connected to said body to receive liquid metal from said means for retaining impurities for discharging the impurity-free metal from the body, and means located in said body upstream of the cooling means in the direction of liquid metal flow through said body for recycling part of the fluid which has passed through the impurity retention means back through said cooling means and said means for retaining impurities.

4,693,089

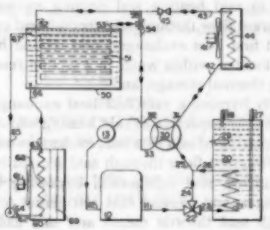
THREE FUNCTION HEAT PUMP SYSTEM

Richard C. Bourne, Davis; Martin Fanciullo, Rancho Cordova, and Willem Bos, Sacramento, all of Calif., assignors to Phenix Heat Pump Systems, Inc., Elk Grove, Calif.

Filed Mar. 27, 1986, Ser. No. 844,545

Int. Cl.[4] F25B 7/00

U.S. Cl. 62—79 13 Claims



1. A three function heat pump system for providing a heating mode, a cooling mode, and a hot water production mode irrespective of said heating and cooling modes, said system comprising:

compressor means for compressing refrigerant,

reversible flow refrigerant conduit means for providing series communication among a first heat exchanger located within a medium contained in a first storage tank, throttle means for reducing the pressure of said refrigerant, and an external heat exchanger;

reversing valve means for selectively determining the direction of flow in said reversible flow conduit means in response to a desired heating or cooling mode, said reversing valve means in a heating mode directing refrigerant flow in a first direction to said first heat exchanger to condense said refrigerant prior to directing said refrigerant through said throttle means to said external heat exchanger to evaporate said refrigerant, said reversing valve means in a cooling mode directing refrigerant flow in a second direction opposite to said first direction to said external heat exchanger to condense said refrigerant prior to directing said refrigerant through said throttle means to said first heat exchanger to evaporate said refrigerant; and

dual condenser means for producing hot water irrespective of said heating and cooling modes, said dual condenser means including a second heat exchanger associated with a second storage tank containing water and having bypass valve means for selectively bypassing said first heat exchanger, said dual condenser means providing series communication between said second heat exchanger and said first heat exchanger when hot water is desired with said heating and cooling modes and bypassing said first heat exchanger when hot water is desired without heating and cooling modes, said second heat exchanger functioning as a condenser for said system.

10. A method of providing space heating, space cooling and hot water in a reversible heat pump system, said method comprising the steps of:

compressing a refrigerant in a compressor,

providing series communication for said refrigerant to flow among the compressor, a first heat exchanger, a throttle device, and an external heat exchanger, said first heat exchanger being located within a medium in a first reservoir for providing thermal storage,

causing said refrigerant to flow in a first direction for space heating and in an opposite second direction for space cooling, the refrigerant flowing in said first direction for space heating condensing in said first heat exchanger prior to flowing through said throttle device for reducing the pressure of the refrigerant, said refrigerant subsequently evaporating in said external heat exchanger to provide space heating, said refrigerant flowing in the second direction for spacing cooling condensing in said external heat exchanger prior to flowing through said throttle device, said refrigerant subsequently evaporating in said first heat exchanger to provide space cooling,

providing a second heat exchanger for producing hot water and locating said second heat exchanger in series communication with said first heat exchanger to provide hot water in said heating and cooling modes by directing refrigerant flow through said second heat exchanger prior to said first heat exchanger, said second heat exchanger being located within water in a second reservoir for providing thermal storage, and

selectively bypassing said first heat exchanger to produce hot water irrespective of said heating and cooling modes, the bypassing of said first heat exchanger including directing refrigerant flow through said second heat exchanger to condense said refrigerant, bypassing said first heat exchanger, and causing said refrigerant to flow directly through said throttle means and said external heat exchanger to evaporate said refrigerant.

4,693,090

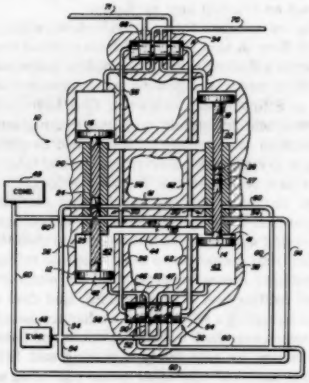
THERMALLY POWERED ENGINE UTILIZING THERMALLY POWERED VALVES

Peter M. Blackman, 16035 N. 43rd St., Phoenix, Ariz. 85032

Filed Oct. 16, 1986, Ser. No. 919,469

Int. Cl.[4] F25B *1/00*

U.S. Cl. 62—116 **18 Claims**



1. A thermally powered engine comprising:

a pair of power cylinders, each power cylinder defining a closed interior space, with each power cylinder having an upper and lower end;

a power piston reciprocally mounted within the interior space of each cylinder, each power piston dividing the interior space of each cylinder into a first portion and a second portion;

a piston rod connected to each power piston and projecting through an end of each cylinder;

a control fluid substantially filling the first portions of the two cylinders;

means for permitting the control fluid to flow between the first portions of the two power cylinders;

a heat transfer loop including a working fluid, an evaporator, a condenser and the second portion of each of the two cylinders;

mechanically powered control means for controlling the flow of the working fluid through the heat transfer loop and through the second portions of each of the power cylinders so that the movement of the power pistons in each of the cylinders is out of phase, said mechanically powered control means including first and second valve assembly means, each valve assembly means having a first and a second state; the first valve assembly means controlling the flow of working fluid through the second portions of each of the cylinders so that when the first valve assembly means is in its first state one piston executes a power stroke and when the first valve assembly means is in its second state the other piston executes a power stroke; the second valve assembly means in its first state causing the first valve assembly to be placed in its first state and when the second valve assembly is in its second state causing the first valve assembly to be placed in its second state; and

means for converting the motion of two piston rods into useful work.

4,693,091

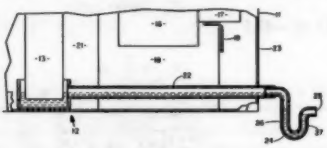
CONDENSATE DISPOSAL SYSTEM

Raymond D. O'Mara, Mallory, and Ian M. Shapiro, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed May 19, 1986, Ser. No. 864,354

Int. Cl.[4] F25D *21/00*

U.S. Cl. 62—272 **7 Claims**



1. A condensate disposal apparatus for an air conditioning system of the type having a fan for creating a zone of negative pressure and a coil located in said zone and being susceptible to the formation of condensate on its outer surface; comprising:

a condensate pan disposed below the coil for collecting the condensate as it falls from the coil, said pan having a discharge opening for the flow of condensate from said pan;

a condensate tube fluidly connected to said discharge opening for further conducting the flow of condensate from the pan;

a trap fluidly connected at the other end of said condensate tube for disposing of the condensate from the tube while preventing the flow of air and in the opposite direction; and

a vent formed in said condensate tube at a location within said negative pressure zone for bleeding off air which may be trapped therein and which would otherwise prevent the flow of condensate from the pan to the trap.

4,693,092

KNITTING MACHINE

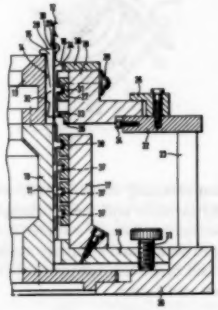
Ernst-Dieter Plath, Tailfingen, Fed. Rep. of Germany, assignor to Sipra Patentestwicklungs-und Beteiligungs-Gesellschaft mbH, Tailfingen, Fed. Rep. of Germany

Filed Sep. 11, 1985, Ser. No. 775,256

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1984, 3433290

Int. Cl.[4] D04B *15/32, 15/06, 15/24*

U.S. Cl. 66—55 6 Claims



1. A knitting machine comprising longitudinally movable latch needles; sinkers longitudinally movable in the same direction as that of said latch needles and pivotable; a sinker support; a needle support, said sinkers being of a small structural length and being positioned in said sinker support which is arranged stationarily relative to said needle support; sinker controlling cams and latch needle controlling cams arranged so that said sinkers during a draw movement of respective needles are longitudinally moved in an opposite direction at least in zones; individual cam supports (**17, 18**), said sinker controlling cams and said needle controlling cams being arranged on said cam supports, respectively, to obtain a predetermined constellation of a needle movement curve (**54**) and a sinker movement curve (**55**), said cam supports being adjustable relative to each other in a longitudinal direction of the sinkers (**15**) and the needles (**12**) and also traversely to said longitudinal direction; at least said cams for said sinkers and said latch needles additionally having loop-sinking cams (**43, 50**) adjustable relative to said cam supports (**17, 18**), said cams being arranged such that the needle movement curve and the sinker movement curve at an end portion of a counter movement have coinciding loop-sinking points (KN, KP) in a direction of running.

4,693,093

CAM SYSTEM FOR KNITTING MACHINES

Klaus Grüssel, Limbach-Oberfrohna, and Andreas Neuer, Karl-Marx-Stadt, both of German Democratic Rep., assignors to VEB Kombinat Textima, Karl-Marx-Stadt, German Democratic Rep.

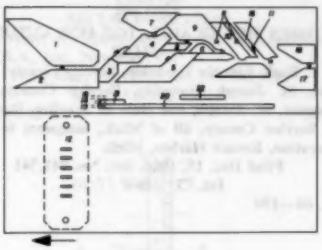
Filed Jul. 1, 1986, Ser. No. 880,916

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1985, 2780356

Int. Cl.[4] D04B *7/00*

U.S. Cl. 66—75.1 4 Claims

1. In a cam system for knitting machines having a movable knitting carriage, the system comprising a drive cam, a loop transfer cam and a loop acceptance cam integrated in said system, and a needle selecting system in which knitting needles are selected in accordance with sinkers, wherein the knitting needles are provided with lateral expanding springs for enabling a loop transfer without racking a needle bed; and a needle spring cam (**10**), the improvement comprising an additional selection cam for excluding a thread acceptance by the selected knitting needles positioned in a full drive position and for guiding said selected knitting needles over an upper needle sinker away in the region of an upper needle clearing cam (**6**); and an additional needle spring cam for bringing said selected



knitting needles to a combing position, said additional needle spring cam being arranged in the direction of moving of the knitting carriage after said aforementioned needle spring cam (**10**).

4,693,094

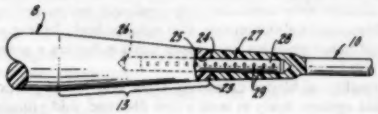
CIRCULAR KNITTING NEEDLE ASSEMBLY

Jan E. Kahn, Oak Lawn, Ill., assignor to Newell Co., Freeport, Ill.

Filed May 16, 1986, Ser. No. 863,776

Int. Cl.[4] D04B *35/02*

U.S. Cl. 66—117 1 Claim



1. In a circular knitting assembly,

a knitting needle,

said knitting needle having a rear end adapted to make abutting engagement with a cable,

a cable,

said cable having an end adapted to make abutting contact with the rear end of a knitting needle,

the rear end of the needle having a smoothly decreasing diameter in the direction of the cable,

the end of the cable having a smoothly increasing diameter in the direction of the needle,

the diameter of the needle and cable being identical at the junction where the respective ends abut,

whereby the junction between each needle and its associated cable end is smooth and uninterrupted throughoutthe useful life of the circular knitting assembly,

connection means for ensuing that no growth appears at the junction between the abutting ends,

said connection means including

a socket having a constant diameter through its operative length formed in the end of the needle,

a socket having the same constant diameter throughout its operative length formed in the end of the cable,

said sockets being axially aligned when the needle and cable are in their final, abutting relationship,

a constant diameter insert received in the aligned sockets in close fitting engagement with the constant diameter sockets in the needle and cable, and

score means on the insert in the area of engagement between the insert and the needle face, and between the insert and the cable face

said cable and needle sockets, where they receive the insert,

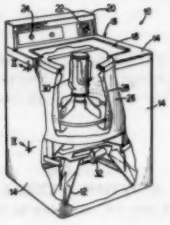
having material integral therewith filling the score means whereby separation of the cable from the socket during the useful of the knitting assembly is precluded.

4,693,095

CLOTHES MOVER AGITATOR FOR AUTOMATIC WASHER

Jeffrey L. Burk, Lincoln Township, Berrien County; Michael J. Bottas, St. Joseph Township, Berrien County; John W. Pielemeier, St. Joseph, and Dale E. Mueller, Benton Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 15, 1986, Ser. No. 941,741
Int. Cl.[4] D06F *17/10*
U.S. Cl. 68—134 **10 Claims**



1. An agitator for use in a wash tub of an automatic washer including a drive motor to rotationally oscillate the agitator within the wash tub to agitate a wash load, comprising:

an agitator body connected for rotational movement by the drive motor about an axis, said agitator body having upper and lower portions, said upper portion having a generally cylindrical surface;

a plurality of blades extending from said lower portion of said agitator body at least a first distance, said plurality of blades agitating the wash load during rotational oscillation of said agitator body; and

a plurality of vanes extending from said upper portion of said agitator body less than said first distance, each of said vanes having an upper end extending substantially parallel to said axis of said agitator body, said upper end being tangential to said cylindrical surface,

each of said vanes having a lower end curving about an arc of said cylindrical surface, said curved lower ends of adjacent ones of said vanes disposed at mutually different radial and longitudinal locations with respect to said axis, said lower curved ends extending further from said cylindrical surface than said upper ends of said vanes,

said plurality of vanes being separate from said plurality of blades.

4,693,096

BRAKE LINE COUPLER LOCK

Sarah F. Mercer, 1007 - 18th St., P.O. Box 1036, Albert Lea, Minn. 56007

Filed Dec. 8, 1986, Ser. No. 939,039
Int. Cl.[4] E05B *73/00*
U.S. Cl. 70—14 **12 Claims**

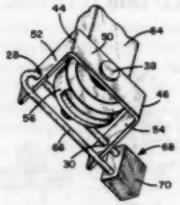
1. A security device for releasable connection to a brake line coupler of a trailer, said device including:

a generally planar, substantially rigid base and means forming an aperture through said base;

an elongate locking pin extended through said aperture and away from the base in a direction generally perpendicular to the plane of said base, and a fastening means on one side of said base for integrally securing the pin with respect to the base;

a first locking arm extended from one end of the base and inclined with respect to said plane; and a second locking arm extended from the opposite end of the base and inclined with respect to said plane;

a substantially rigid retaining member; a first retaining means formed near the free end of said first arm; and a second retaining means formed near the free end of said second arm; said retaining means adapted for mutually releasably



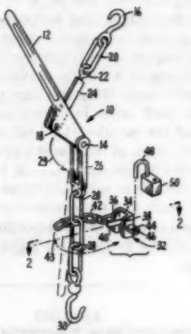
engaging said retaining member and, when so engaging said retaining member with said locking pin inserted into a recess open to one side of a trailer brake line coupler, cooperating to secure said retaining member on the opposite side of said brake line coupler to prevent removal of said pin from said recess.

4,693,097

PORTABLE CHAIN LOCK

Charles A. Rivera, 37849 Birch St., Newark, Calif. 94560

Filed Jun. 9, 1981, Ser. No. 271,978
Int. Cl.[4] E05B *73/00*
U.S. Cl. 70—18 **1 Claim**



1. In combination with a chain binder having two halves in the chain tightened position, a portable chain lock adapted to secure said chain binder in the chain tightened position, said chain lock comprising a U-shaped body having a bottom wall and two sidewalls fixed to said bottom wall, said sidewalls having inside and outside surfaces, a pin fixed to said bottom wall between said inside surfaces of said sidewalls, said pin inserted into and held in an opening on one half of said chain binder, a flexible locking chain having two ends, one end fixed to the outside surface of a first of said sidewalls and the other end wrapped around said chain binder and looped over a holding arm fixed to the outside surface of a second of said sidewalls, said holding arm having an opening therein adapted to receive a hasp of a padlock, whereby when said padlock is locked in said opening in said holding arm, said chain lock will be locked in position around said chain binder to prevent opening thereof.

4,693,098

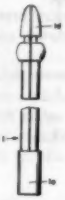
NON-KEY LOCKING CABLE LOCK

Jeffrey L. Davis, 13235 SW. 121st, Tigard, Oreg. 97223; Daniel S. Evans, 1327 Tamarisk Dr., West Linn, Oreg. 97068, and Lawrence P. Hall, 2601 SE. 170th St., Portland, Oreg. 97236

Filed Dec. 22, 1986, Ser. No. 945,000

Int. Cl.[4] B62H *5/00*

U.S. Cl. 70—233 **6 Claims**



1. A cable-lock device for tubular frame vehicles, wherein the cable member is storeable in a hollow frame of the vehicle and is removable without a key from said hollow and capable after insertion into a lock member affixed to said vehicle of locking said vehicle without a key to a stationary structure comprising:

two equal lengths of cables swaged together at one end and having identical halves of a phallic head plug with grooves therein at another end; and

a locking mechanism comprising a sliding latch plate biased in a rest position by a spring, said latch plate having in its lower part of semi-circular opening with an arc at the midpoint of the semi-circle into which said phallic head is inserted to push the latch plate upwardly against said spring until the groove in said phallic head plug is aligned with the semi-circle, said mechanism having a lock plug rotatable cylinder at the opposite end and above said semi-circular opening to release said plug upon rotation of a key inserted in an opening of said lock plug rotatable cylinder.

4,693,099

LOCKING ARRANGEMENT FOR THE GEARSHIFT STICK OF VEHICLES

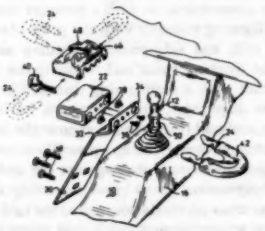
Josef Cykman, 75 Ben Yehuda St., Tel Aviv, Israel

Continuation-in-part of Ser. No. 650,310, Sep. 12, 1984, abandoned. This application May 13, 1986, Ser. No. 862,682

Claims priority, application Israel, Sep. 16, 1983, 69748

Int. Cl.[4] B60R *25/06;* **E05B** *65/12*

U.S. Cl. 70—247 **6 Claims**



1. An arrangement for preventing motor car theft by locking the gearshift stick to a fixed portion of the motor car comprising a rigid bar rigidly secured to a body portion of the motor car in the vicinity of, parallel to and a length shorter than that of the gearshift stick, a padlock body fixedly mounted onto the bar, and a separable padlock shackle adapted to be locked to the padlock body with the stick enclosed by the shackle, said rigid bar defining a flanged seating portion to which said lock body is affixed and through which the legs of said shackle are inserted in the locked orientation.

4,693,100

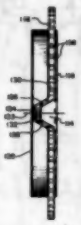
SECURITY SYSTEM

Leonard R. Wetz, Jr., Manmouth County, N.J., assignor to Art Metal U.S.A., Inc., Newark, N.J.

Filed Mar. 21, 1986, Ser. No. 842,141

Int. Cl.[4] E05B *15/14*

U.S. Cl. 70—333 A **51 Claims**



1. A tumbler arrangement for a combination lock adapted for having its combination changed either by hand or with the use of a key, said tumbler arrangement comprising:

means for mounting a plurality of tumbler wheels in a stacked relationship for rotation about an axis, each of said tumbler wheels having an inner element releasably engaged with a circumferentially disposed outer element, with each said outer element having a peripheral gate and means for masking said gate;

means for maintaining said inner and outer elements in an engaged condition for simultaneous rotation under normal tumbler operation;

a peripherally gated rotatable driver wheel for rotating said tumbler wheels;

a fence lever having a nose for contact with said driver wheel and a fence for contact with said tumbler wheels;

means for preventing contact by said fence with the circumferential edges of said tumbler wheels while said tumbler wheels are being rotated; and

means for axially disengaging said stacked inner elements from said stacked outer elements by said key while simultaneously preventing rotational and axial movement of said outer elements as the disengaged inner elements are rotated to change the combination of said tumbler arrangement.

4,693,101

ADAPTIVE, SELF-REGULATING FORGING HAMMER CONTROL METHOD

Charles J. Crout; Charles W. Frame, both of Chambersburg, and Ronald N. Harris, Ft. Loudon, all of Pa., assignors to Chambersburg Engineering Company, Chambersburg, Pa.

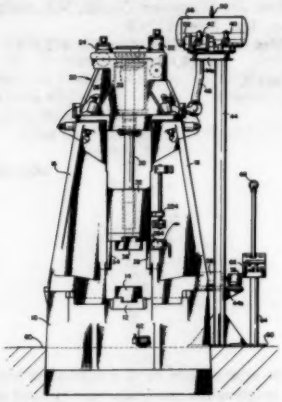
Division of Ser. No. 695,697, Jan. 28, 1985, Pat. No. 4,653,300. This application Jan. 5, 1987, Ser. No. 576

Int. Cl.[4] B21J *7/38, 7/40*

U.S. Cl. 72—20 **4 Claims**

1. The method of obtaining a preselected kinetic energy at the time of impact in blows of a ram of a forging hammer ina system employing an impact device having a frame supporting at least one cylinder, a piston within said cylinder, means connecting the piston to a ram such that the ram is repeatedly movable relative to the frame from a retracted position into impact position, a driving fluid system including a fluid supply, value means connecting said fluid supply into said at least one cylinder at a position in the cylinder to drive the ram into impact position and permitting release of fluid from the cylinder, and a source of lifting fluid causing the ram to be retracted from impact position when fluid driving the ram into impact is

released from the cylinder, comprising: sensing when the ram and piston are in a predetermined position adjusting the valve means such that fluid flows into the cylinder at a time related to the sensed postion of the ram and piston, determining periodically sensing pressure of the lifting fluid beneath the ram at



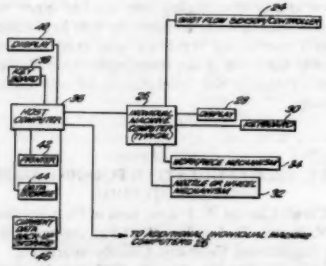
regular time intervals to determine the rate of change of pressure with respect to time at various such intervals, employing a computer having a memory to determine maximum velocity from rate of change of pressure with respect to time, calculating from the kinetic energy maximum velocity and ram mass.

4,693,102

SHOT-PEENING METHOD

A. André Amy, Lafayette, and Jules Babineaux, Scott, both of La., assignors to Metal Improvement Co., Inc., Paramus, N.J.

Filed Nov. 5, 1985, Ser. No. 795,175
Int. Cl.[4] B24C *1/10*
U.S. Cl. 72—53 **3 Claims**



1. A method of producing a series of essentially idential articles in shot-peening equipment having nozzles or wheels for subjecting the articles to shot-peening, comprising the steps of;

(a) developing a set of critical shot-peening parameters yielding specified article properties;

(b) rigidly controlling certain of said shot-peening parameters by using part holding fixtures, Almen strip fixtures, and nozzle fixtures;

(c) continuously controlling shot media by segregating the media both by size and shape;

(d) with a computer controlling, monitoring and documenting said certain critical shot-peening parameters;

(e) with a computer also controlling said controlled shot-peening equipment such that said critical processing parameters stay within preselected maximum and minimum values;

(f) shutting down the shot-peening equipment if the maximum or minimum values are exceeded;

(g) keeping the equipment shut down unless all monitored parameters have been brought with the preselected maximum and minimum values;

(h) documenting via computer print-out, time of any shut down, cause of any shut down, and successful completion of the process; and

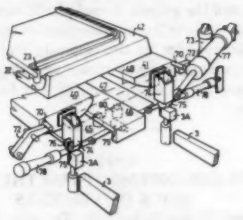
(i) documenting the monitored parameters throughout the process, start and successfully completion of process, the maximum and minimum values for each parameter monitored, movement of the nozzles, which nozzles are active, and identification of the articles shot-peened.

4,693,103

FORMING PRESS OF THE PRESSURE CELL TYPE AND A PROCESS FOR CHANGING DIAPHRAMS IN SUCH A PRESS

Keijo Hellgren, Västeras, Sweden, assignor to ASEA AB, Västeras, Sweden

Filed Apr. 21, 1986, Ser. No. 853,953
Claims priority, application Sweden, Mar. 4, 1986, 8600973
Int. Cl.[4] B21D *22/12*
U.S. Cl. 72—63 **8 Claims**



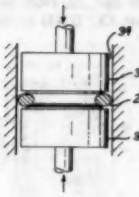
1. A forming press of the pressure cell type, comprising a press stand with two opposing pressure absorbing elements defining between them a working space into which a trough for supporting forming tools and a workpiece is insertable; a press plate in communication with a pressure medium source; a diaphragm forming together with the press plate an expansible pressure cell; and side pieces extending along the side surfaces of the working space and retaining the diaphragm in abutting contact with a sealing ring disposed around the periphery of the diaphragm, said side pieces having long sides and end faces, and said ring abutting against the press plate, the side pieces being pivotable into an upwardly swung position so that said long sides thereof abut against the underside of the diaphragm, longitudinal pivot pins projecting outwardly of said end faces, arms pivotally journalled on said press having shaft supports in engagement with said pivot pins so as to define swivels for the side pieces upon pivotable movement thereof, the arms being pivotable into a position out of interference with the side pieces to permit the removal of the unit, and swinging mechanisms mounted on the press and detachably connected to the side pieces for pivoting the side pieces into the upwardly swung position about said swivels, the upwardly swung side pieces and the diaphragm resting thereon comprising a unit removable from the working space, and means on the side pieces for guiding the unit upon removal.

4,693,104

PROCESS FOR MANUFACTURING A SINGLE PIECE ALUMINUM ALLOY WHEEL RIM FOR VEHICLE TIRES

Hiroshi Mori, 2751 Aqua Verde Cir., Los Angeles, Calif. 90077

Filed Apr. 8, 1985, Ser. No. 721,172
Int. Cl.[4] B21H *1/10*
U.S. Cl. 72—68 4 Claims



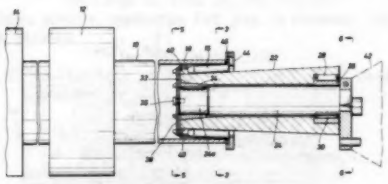
1. A process for forming a single piece rim for vehicle wheels of the type having a radially directed flange for use in securing the rim to a wheel center, said process comprising the steps of pressing against a toroid of alloy material in opposite axial directions to cause said material to flow axially and radially so as to define a hollow tubular element of predetermined length having an annular inwardly directed radial flange intermediary of the ends thereof and spaced predetermined distances from the ends of said element; and bending the ends of said element radially outwardly and axially to define an inner rim flange and an outer rim flange.

4,693,105

METHOD OF AND APPARATUS FOR STRAIGHTENING, SWAGING, AND THREADING A PIPE

Roy Lee, Jr., 10134 Briar Dr., Houston, Tex. 77042

Continuation-in-part of Ser. No. 540,342, Oct. 11, 1983, abandoned. This application Feb. 7, 1985, Ser. No. 699,041
Int. Cl.[4] B21D *3/02*
U.S. Cl. 72—84 11 Claims



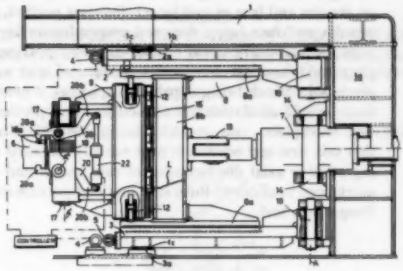
1. A method of swaging the end of a pipe for threading comprising the steps of rotating the pipe around its longitudinal axis, gripping the pipe with a chuck at a location close enough to the end to be swaged to create bending stresses in the pipe above its yield point when the pipe is forced to rotate on the axis of rotation of the chuck, and moving a plurality of rollers along the axis of rotation of the chuck into engagement with the end of the rotating pipe to force the end of the pipe to rotate around the axis of rotation of the chuck thereby straightening the end of the pipe between the chuck and the rollers and to swage the pipe into the desired thread form concentric with the fixed axis of rotation of the end of the pipe whereby threads can be cut on the thread form that are concentric with the end of the pipe.

4,693,106

APPARATUS FOR AXIALLY SHIFTING ROLLS IN A ROLL STAND

Hans Frosch, Neuss, Fed. Rep. of Germany, assignor to SMS Schleomann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 6, 1986, Ser. No. 872,101
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1985, 3525462
Int. Cl.[4] B21B *31/18*
U.S. Cl. 72—247 7 Claims



1. In combination with a roll stand having a roll centered on an axis and provided at one end with a journal block, an apparatus for axially shifting the roll comprising:

an outer frame fixed relative to the stand at the journal block;

a pair of arms extending parallel to one another and having outer ends pivoted on the outer frame at a common arm axis generally perpendicular to the roll axis and inner arm ends adjacent the block;

means including actuators engaged between the inner arm ends and the outer frame for vertically displacing the inner arm ends with pivoting of the arms about the arm axis to a position with the inner arm ends generally level with the journal block;

an inner frame slidable perpendicular to the arm axis on the arms;

a grab mount pivotal on the inner frame about an inner axis parallel to the arm axis;

a grab carried on the mount and axially couplable with the journal block; and

means including an actuator having an inner end pivoted at the arm axis on the outer frame and an outer end pivoted on the inner frame for sliding the frame along the arms and thereby axially displacing the roll coupled to the grab.

4,693,107

METHOD OF MANUFACTURING WOUND BUSH BEARING WITH NOTCH-FREE FLANGE AND MOLD ASSEMBLY FOR MANUFACTURING THE SAME

Masayuki Kohama, Moriyama; Tatsuro Wakabayashi, and Kouichi Tsunoda, both of Shiga, all of Japan, assignors to Oils Industry Co., Ltd., Tokyo, Japan

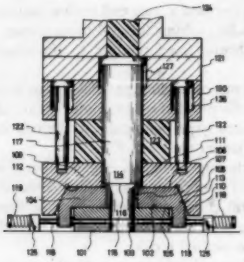
Division of Ser. No. 603,656, Apr. 25, 1984, Pat. No. 4,638,538. This application Sep. 11, 1986, Ser. No. 906,145
Claims priority, application Japan, Apr. 28, 1983, 58-74068
Int. Cl.[4] B21J *13/02*
U.S. Cl. 72—354 12 Claims

1. A mold assembly for manufacturing a wound bush bearing with a notch-free flange from a substantially cylindrical bush workpiece inserted therein, said workpiece having first and second end portions, the longitudinal axis of said workpiece defining an axial direction, said first end portion being uniformly tapered at at least one of the outer and inner circumferential surfaces so that the radial thickness of said first end

portion is gradually decreased toward the end face of said first end portion, the length of said first end portion in said axial direction being greater than the width of a rear face of said flange to be formed, said mold assembly having an upper mold and a lower mold.

(a) said upper mold comprising:

(i) a punch having a smaller-diameter portion for restricting the radially inward movement of said inner circumferential surface of said workpiece, and a larger-diameter portion continuous with said smaller-diameter portion by way of a shoulder having a smoothly continuous configuration formed by a curved concave portion and an annular end face of said larger-diameter portion, said annular end face being disposed perpendicular to said axial direction when said smaller-diameter portion engages said inner circumferential surface of said workpiece, said punch being capable of applying a pressing force in said axial direction to said first end portion of said workpiece, said shoulder being configured such that said first end portion is bent radially outward during relative axial displacement of said punch and said workpiece in order to form said first end portion into a flange part, and



(ii) a flange clamping mold having a larger-diameter bore for slidably receiving said larger-diameter portion of said punch, and restricting the radially outward movement of said first end portion in order to form said notch-free flange from said flange part, said flange clamping mold being movable axially together with said punch,

(b) said lower mold comprising:

(i) an end face member provided with a first smaller-diameter bore for slidably receiving said smaller-diameter portion of said punch, and restricting the movement of said second end portion of said workpiece on an upper face thereof, and

(ii) a pair of vertically split clamping molds, each mounted on said upper face of said end face member so as to be slidable in a direction perpendicular to said axial direction, said vertically split clamping molds forming a second smaller-diameter bore for restricting the radially outward movement of said outer circumferential surface of said workpiece, the radius of said larger-diameter bore being greater than the radius of said second smaller-diameter bore by an amount substantially equal to the width of said rear face of said flange.

4,693,108

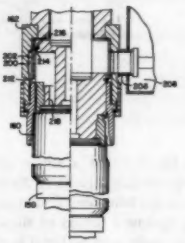
METHOD AND APPARATUS FOR NECKING AND FLANGING CONTAINERS

Edward S. Traczyk, Lockport, and Michael M. Shulski, Northfield, both of Ill., assignors to National Can Corporation, Chicago, Ill.

Division of Ser. No. 453,232, Dec. 27, 1982, Pat. No. 4,519,232. This application Apr. 22, 1985, Ser. No. 725,945

Int. Cl.[4] B21D *41/04*

U.S. Cl. 72—370 **7 Claims**



1. A method of necking an open-ended thin-walled metal container comprising the steps of producing relative movement between a necking die, a punch and said container to (1) initially produce engagement between said necking die and an outer surface of said container; (2) produce relative movement between said container, the necking die and the punch; and, (3) produce engagement between an inner surface of said container and said punch during relative movement so that the metal in the container is drawn into the necking die while being formed to a configuration of the necking die.

4,693,109

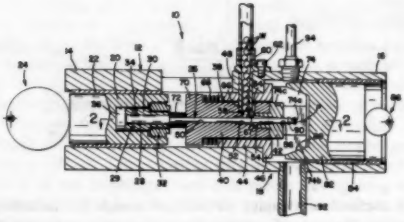
SELF-ALIGNING TOOL ASSEMBLY FOR DIE SHAPING WORKPIECES

Mark J. Connor, Greenville, Del.; George H. Reinemuth, Glen Mills, and Richard S. Cleveland, Swarthmore, both of Pa., assignors to Wickes Manufacturing Company, Southfield, Mich.

Filed Mar. 4, 1986, Ser. No. 836,045

Int. Cl.[4] B21D *37/10*; B21J *13/04*

U.S. Cl. 72—456 **33 Claims**

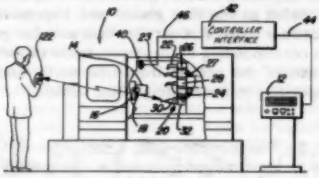


1. A self-aligning tool assembly for die shaping workpieces, comprising support means, die means on said support means and having a die axis, tool means on said support means having a tool axis and a working end, means for reciprocating said tool means axially through a stroke including a working portion in which said working end and said die means cooperatively shape a workpiece therebetween, guide means supporting said tool means adjacent said die means, and align-ing means on said guide means and die means clampingly interengaged against relative axial and lateral displacement during said working portion of said stroke and aligning said die and tool during said working portion of said stroke.

4,693,110
METHOD AND APPARATUS FOR TESTING THE OPERABILITY OF A PROBE

Richard O. Juengel, Romeo, Mich., assignor to GTE Valeron Corporation, Troy, Mich.

Filed Jun. 6, 1985, Ser. No. 741,869
Int. Cl.[4] G01D *18/00*; G01M *19/00*; G01B *11/00*
U.S. Cl. 73—1 R **21 Claims**



1. An apparatus for testing the operability of a probe for detecting contact with an object having a displaceable stylus, said probe being used in a machine tool system having a controller, said apparatus comprising:

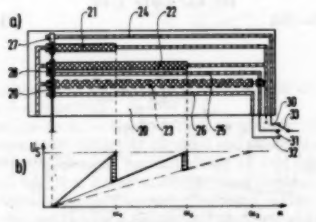
first circuit means for generating a first signal, said first circuit means able to generate said first signal independently of said controller, said first signal inducing said probe to generate a second signal; and

second circuit means for receiving said second signal, said second circuit means being adapted to generate a third signal indicative of the operability of said probe when said second signal is received, said third signal comprising first and second indicator signals, said first indicator signal being generated when said second signal has a first characteristic, said second indicator signal being generated when said second signal has a second characteristic produced in response to the displacement of said stylus.

4,693,111
POSITION SENSOR FOR A MOVABLE PART IN A MOTOR VEHICLE

Herbert Arnold, Eberdingen; Walter Bosch, Waiblingen; Michael Horbelt; Wolfgang Maisch, both of Schwieberdingen; Hermann Nusser, Markgröningen; Klaus-Jürgen Peters, Affalterbach; Peter Werner, Wiernsheim, and Clemens Willke, Ditzingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 13, 1985, Ser. No. 775,757
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1984, 3433585
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—118.1 **10 Claims**



1. A position detecting device for detecting the position of a movable part over a total range of movement, the device comprising:

a plurality of position pick-ups for picking up a position signal;

a plurality of paths corresponding to respective ones of said pick-ups, said paths being arranged so as to be mutually adjacent and having respectively different lengths over said range so as to conjointly define respective sub-ranges;

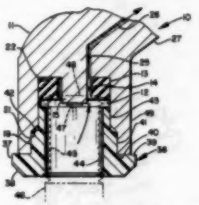
a single drive common to all of said pick-ups for simultaneously driving the latter over respective ones of said paths so as to pass sequentially through said sub-ranges; and,

said pick-ups being driven over said paths to engage corresponding ones of said paths at respective times during the movement of said pick-ups over said range thereby providing a variant resolution of said position signal at corresponding ones of said sub-ranges.

4,693,112
AIR CONDITIONER REFRIGERANT CHECK GAUGE INSERT CONVERTIBLE TO A TIRE CHECK GAUGE

James E. Ferris, 15 High Mesa Pl., Richardson, Tex. 75080

Filed Jun. 12, 1986, Ser. No. 873,386
Int. Cl.[4] B60C *23/02*; G01L *7/16*
U.S. Cl. 73—146.8 **9 Claims**



1. A refrigerant system pressure check gauge comprising: a refrigerant system gas pressure check gauge with a valve head having a valve head opening that fits on and over a refrigeration system valve; a valve pin within said valve head opening positioned to engage and depress a valve stem pin of said refrigeration system valve to open the valve; a resiliently compressible washer, mounted in said valve head opening, and having a center opening sufficiently larger than said valve pin as to not close on said valve pin in order that gas under pressure may pass on through into the valve head; said resiliently compressible washer being so positioned and of such thickness as to be engaged and resiliently compressed by the outher end of said refrigeration system valve as a valve stem pin is being depressed by said valve pin to open said refrigeration system valve; and with said valve pin positioned to engage the said valve stem pin of the refrigeration system valve fitting so that as the pressure gauge is pushed toward the refrigerant valve sitting received in said gauge valve head opening the refrigeration system valve is opened and refrigeration material gases pass from the refrigeration system through internal opening passage means through the pressure gauge to provide a refrigerant gas charge pressure reading for the refrigerant system; wherein a tire valve stem insert guide is provided that is a snug fit in said valve head opening for converting said pressure check gauge from a refrigerant system pressure check gauge to a tire pressure check gauge; and a cylindrically walled insert guide opening through said insert guide with said guide opening sized and centered to be a guide for tire valve stem threaded end insertion to aligned contact of the tire valve stem pin with said valve pin; said resiliently compressible washer is so positioned and of such thickness as to be engaged and resiliently compressed by the outer end of said tire valve stem as the valve stem pin is being depressed by said valve pin to open said tire air valve; said valve pin is positioned to engage said tire valve stem pin of a tire valve so that as the gas pressure gauge is pushed toward the tire valve stem received in said insert guide opening in the insert held in said gauge valve head opening the tire valve is opened for passage of air under tire pressure to and through internal passage means in the pressure gauge to provide an air pressure reading for tire air pressure;

said valve stem insert guide is formed with an enlarged outer head with a shoulder that contacts the end of a gauge valve head opening projection having a circumferential periphery; and with said shoulder extending radially outward beyond the circumferential periphery of said gauge valve head opening projection that facilitates manual removal of said insert guide for conversion of the gauge back to the air conditioner refrigerant pressure check state.

4,693,113

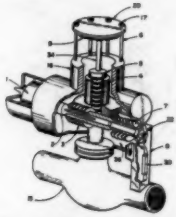
MOTOR OPERATED VALVE ANALYSIS AND TESTING SYSTEM

John A. McNennamy, Cobb; Steven Nafziger, Gwinnett; Arthur G. Charbonneau, Marietta, and Dwaine A. Godfrey, Fulton, all of Ga., assignors to Charbonneau and Godfrey Associates, Marietta, Ga.

Division of Ser. No. 741,861, Jun. 6, 1985, Continuation of Ser. No. 515,358, Jul. 19, 1983, Pat. No. 4,542,649. This application Jun. 23, 1986, Ser. No. 877,974

Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—168 **12 Claims**



1. A spring pack movement monitoring device for monitoring the movement of the spring pack found within a valve operator, wherein the valve operator includes a driven worm shaft, which in turn drives a worm, which in turn drives a worm gear which in turn drives a valve stem to open and close a valve attached to the valve stem, and a spring pack provided at one end of the worm shaft for compression by the worm, said spring pack movement monitoring device comprising:

a spring pack engagement member for making contact with the spring pack;

tension means for maintaining said spring pack engagement member in constant contact with the spring pack;

said engagement member moving in direct response to movement of the spring pack;

a linear velocity differential transducer in communication with said spring pack engagement member and comprising a core element movable relative to a bracket element, wherein movement of the spring pack results in a relative movement between said core element and bracket element;

said linear velocity differential transducer further comprising means for detecting the relative movement between said core element and bracket element; and

means for recording the detected movement between said core element and bracket element.

4,693,114

GYROCOMPASS NAVIGATION SYSTEM FOR LAND VEHICLES

Frank S. DeCarlo, Paramus, and Frank L. Rosen, Parsippany, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 5, 1986, Ser. No. 859,542

Int. Cl.[4] G01C *21/00*

U.S. Cl. 73—178 R **12 Claims**

1. A gyrocompass navigation system for land vehicles characterized by:

a case mounted in a vehicle;

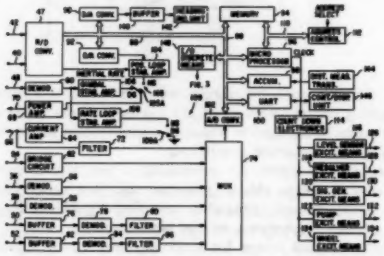
a first gimbal journalled in the case for displacement about a first axis;

a gyro including a second gimbal journalled in the first gimbal for displacement about a second axis;

the gyro being initially in a gyrocompassing mode, said gyro having an input axis which moves in a plane defined by the longitudinal and lateral axes of the vehicle;

means for displacing the first gimbal about the first axis;

means coupled to the first gimbal and responsive to the displacement thereof about the first axis for providing signals corresponding to the displacement of the longitudinal axis of the vehicle from true north, said signals corresponding to the heading of the vehicle;



means coupled to the second gimbal for rotating the gyro input axis substantially ninety degrees, with the gyro thereupon stabilizing the displacement of the first gimbal about the first axis and being rendered in a navigation mode;

means coupled to the first gimbal for detecting gyro drift and for compensating for said drift;

means for providing signals corresponding to the distance travelled by the vehicle; and

means connected to the vehicle distance signal means and the vehicle heading signal means and responsive to the signals therefrom for providing the present position of the vehicle.

4,693,115

DEVICE FOR MEASURING FLOW RATE OF AIR

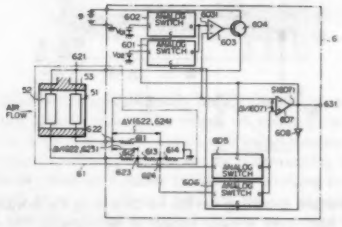
Norihito Tokura, Aichi; Mitiyasu Moritugu, Nishio, and Hisasi Kawai, Toyohashi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Apr. 19, 1985, Ser. No. 724,964

Claims priority, application Japan, Apr. 24, 1984, 59-83269; Jul. 3, 1984, 59-138219; Jan. 15, 1985, 60-5552

Int. Cl.[4] G01F *1/68*

U.S. Cl. 73—204 **11 Claims**



1. A device for measuring the flow rate of air comprising:

an electric heater arranged in a path of air flow and having a temperature dependent resistance material;

a temperature compensation resistor disposed at a distance

from said heater in said path of air flow, the resistance of said resistor being changed according to the temperature of air, said temperature compensation resistor, and said heater being arranged to form a bridge circuit together with a plurality of fixed resistors;

electric power supply means for supplying said bridge circuit with electric power;

temperature selection means for selecting one of a plurality of temperature values to be attained by said electric heater, said temperature values being determined according to a change of resistance of said temperature compensation resistor;

comparator means for comparing the temperature of said electric heater with said selected one of temperature values selected by said temperature selection means;

electric power value switching means for switching an electric power level of said electric power supply means in response to an output of said comparator means indicative of a condition that one of said selected temperature values is attained or maintained;

temperature switching means for switching the selected temperature of said temperature selection means substantially simultaneously with the switching of said electric power value switching means; and

time measurement means for measuring the time required for the change of temperature between said plurality of temperature values due to the change of the temperature of said electric heater caused by the switching by said electric power value switching means;

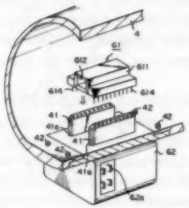
the time measured by said time measurement means corresponding to the flow rate of air.

4,693,116

SEMICONDUCTOR-CHIP GAS-FLOW MEASURING APPARATUS

Kazuhiko Miura, Aichi; Tadashi Hattori; Yukio Iwasaki, both of Okazaki; Tokio Kohama, Nishio, and Kenji Kanehara, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Continuation of Ser. No. 621,628, Jun. 18, 1984, abandoned.
This application Nov. 27, 1985, Ser. No. 802,616
Claims priority, application Japan, Jun. 20, 1983, 58-110399
Int. Cl.[4] G01F *1/68*
U.S. Cl. 73—204 **16 Claims**



1. An apparatus for measuring the flow rate of gas through a passage comprising:

a semiconductor chip including an electric heater, a first temperature-detecting element, and a second temperature-detecting element located closer to said electric heater than said first temperature-detecting element;

said semiconductor chip being mounted within said passage so that said electric heater, and said first and second temperature-detecting elements are in line with the direction of the gas stream;

support means for supporting said semiconductor chip so as to expose both the front and back of said semiconductor chip to the gas stream, thereby suppressing the transfer of heat from said semiconductor chip to said support means, said support means comprising two protrusions having approximately the same width as that of said semiconductor chip, the end portions of said semiconductor chip being fixed to said protrusions; and

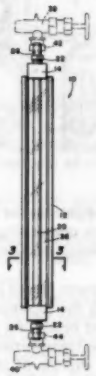
sensing circuit means, connected to said semiconductor chip, for controlling the power supplied to said electric heater so that the difference in temperature between said first and second temperature-detecting elements is definite, thereby generating a voltage corresponding to a flow rate of said gas flowing through said passage.

4,693,117

REPLACEMENT ELEMENT FOR AT LIQUID LEVEL GAUGE SIGHT TUBE

Stephen K. Mills, Tulsa, Okla., assignor to Kenco Engineering Company, Tulsa, Okla.

Filed Sep. 13, 1985, Ser. No. 775,804
Int. Cl.[4] G01F *23/02*
U.S. Cl. 73—326 **4 Claims**



1. A shielded tubular gauge for placement between two spaced apart compression type fittings connected to a vessel or the like so as to show a liquid level, comprising:

a single elongated vertical sheet metal structural frame of single thickness throughout its expanse, the frame having an upper end and a lower end, the sheet metal frame being bent into a generally square cross-sectional channel configuration and being open on one side and closed on three sides, the open side providing spaced-apart vertical edges, each edge being bent into a U-shaped cross-sectional shape, the open ends thereof facing each other;

a first connection housing secured to said upper end of said frame and a second connection housing secured to said lower end of said frame, each housing having an opening therethrough, each opening having a portion which is internally threaded, the housings being secured to said frame with said openings in axial alignment and with the threaded portions extending opposite each other;

a transparent tubular member received in said frame and said housing openings;

two packing members, each having an opening therethrough and each having an external threaded portion at one end and an external cylindrical surface at the other end, each of said threaded portions being receivable in a respective one of said connection housing threaded openings, and when so positioned, snuggly receiving an end portion of said transparent member;

packing means within each of said connection housings surrounding the end portion of said transparent member and engaged by said packing member for sealably closing said transparent member and said packing members; and

an elongate sheet of protective material slideably received in said U-shaped portions of said frame vertical edges, said tubular member being visible through said sheet of protec-

tive material whereby said transparent tubular member is protectively surrounded on all sides and the shielded tubular gauge may directly replace a standard tubular sight glass having an outside diameter substantially the same as the outside diameter of said packing members external cylindrical surfaces.

4,693,118

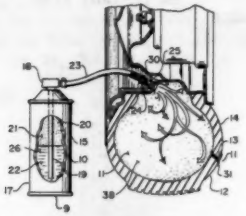
PNEUMATIC TIRE LEAK DETECTOR

Simon Roberts, 30543 Shoreham, Southfield, Mich. 48076

Division of Ser. No. 750,591, Jul. 1, 1985, Pat. No. 4,612,798. This application Apr. 25, 1986, Ser. No. 856,007

Int. Cl.[4] G01M *3/04*

U.S. Cl. 73—40.7 **9 Claims**



8. A leak detector apparatus for detecting the location of a leak in a pneumatic tire comprising in combination:

(a) a pressure sustaining container for storing a powdered pigment;

(b) a powdered pigment stored inside of said container for visually indicating the location of a leak in said tire, said powdered pigment being of a material and a fine enough particle size to be transported by a propellant from the container to the interior of the tire, thence to combine with said propellant and air inside the tire to form an aerosol suspension of powdered pigment throughout the interior of the tire, and thence to flow through and stain the perimeter of a puncture in the tire to visually detect the location of a leak in the tire;

(c) a closure threadably connected to said container for adding said powdered pigment;

(d) an inlet fitting mounted on said closure for admitting a propellant into said container;

(e) a propellant for transporting the powdered pigment to the interior of a tire;

(f) a manually operated outlet valve mounted on said closure for controlling the discharge of powdered pigment and propellant from said container;

(g) a flexible tube for conveying said powdered pigment to said tire;

(h) a fitting attached to one end portion of said tube for connecting said tube to the outlet valve mounted on said closure; and

(i) a fitting attached to the other end portion of said tube for connecting said tube to an inlet valve of the tire, said fitting having a means for sealing the attachment of the tube to the inlet valve and a means for opening the tire inlet valve.

4,693,119

LITHIUM BATTERY ENERGY MONITOR

Leopold J. Johnson, Valley Center, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 17, 1986, Ser. No. 819,947

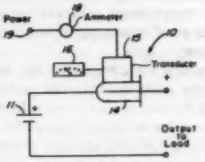
Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—579 **8 Claims**

1. An apparatus for monitoring the energy level of a battery delivering a load current comprising:

means for imparting vibratory motion over a predetermined frequency range;

means connected to the battery and operatively coupled to the vibratory motion imparting means having a cantilevered electrode for changing its resonating mass in response to deposits thereon caused by accumulations of the load current; and



means electrically coupled to the vibratory motion imparting means for indicating a change of resonant frequency of the resonating mass changing means as more deposits are accumulated on the cantilevered electrode thereby monitoring the energy level of the battery.

4,693,120

REAL TIME ULTRASONIC SCANNING METHOD AND APPARATUS

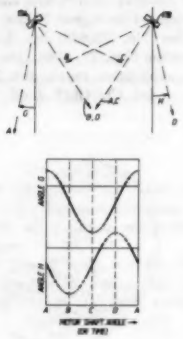
David E. Robinson, Bilgola Plateau, Australia, assignor to The Commonwealth of Australia, Australian Capital Territory, Australia

Filed Jun. 23, 1986, Ser. No. 877,485

Claims priority, application Australia, Jun. 26, 1985, PH1224

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—618 **6 Claims**



1. A method of producing a sectional ultrasonic echogram of an object comprising the steps of

(a) mounting a pair of ultrasonic transducers in spaced-apart relationship adjacent to said object, each transducer transmitting pulses of ultrasonic energy into the object when the transducer is activated and receiving echoes of the pulses from acoustic discontinuities in the object;

(b) oscillating each said transducer about a respective axis which passes through the transducer, each transducer being oscillated through substantially the same predetermined angle with the same period of oscillation;

(c) synchronising the oscillation of the transducers so that when one of the transducers is at substantially the midpoint of its predetermined angle of oscillation, the other transducer is in the region of one of the edges of its predetermined angle of oscillation;

(d) providing a stream of electrical pulses at a constant pulse

repetition rate, each of said electrical pulses being adapted to activate the ultrasonic transducers; and

(e) supplying the electrical pulses to the ultrasonic transducers in such a manner that

(i) when one of the transducers is in the region of said mid-point of its predetermined angle of oscillation, it receives a predominance of the electrical pulses, and

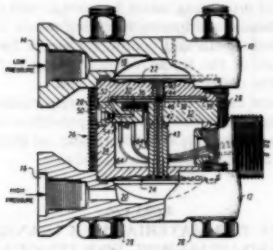
(ii) when the transducers are each between their respective mid-points of their angles of oscillation and an edge of their angles of oscillation, the electrical pulses are supplied alternately to the transducers.

4,693,121

DIFFERENTIAL-PRESSURE MEASURING APPARATUS WITH IMPROVED OVERPRESSURE PROTECTION

Howard W. Nudd, Jr., Foxboro, and David N. De Moura, Taunton, both of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed Jun. 5, 1985, Ser. No. 741,538
Int. Cl.[4] G01L *7/08, 9/00*
U.S. Cl. 73—706 **18 Claims**



1. In a differential-pressure measuring instrument of the type including a sealed interior pressure chamber containing a fill-liquid and having a pair of flexible diaphragms through which an input differential pressure may be applied to said fill-liquid, said instrument further including sensing means responsive to said differential pressure to produce a corresponding output signal;

that improvement for protecting the instrument from over-range pressure conditions comprising:

a circular spring plate extending completely across said pressure chamber between said diaphragms dividing said pressure chamber into first and second fill-liquid sections and responsive to said differential pressure to effect corresponding deflection thereof;

a valve-closure member secured to one side of said circular spring plate at the center of the circle defining the outer edges of said plate;

valve seat means in the chamber section adjacent said one plate side and operable upon engagement by said valve-closure member to close off liquid communication between the region adjacent said one side and the remainder of the fill-liquid of the corresponding chamber section;

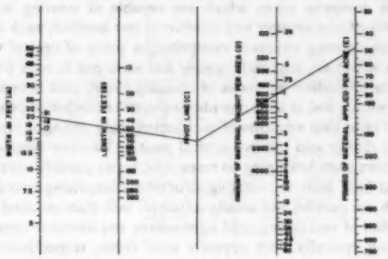
said spring plate being operable to move said valve-closure member into engagement with said valve seat means to close said valve seat means upon deflection of the center of said spring plate by a differential pressure exceeding a predetermined magnitude, whereby the fill-liquid on said one side of said spring plate is locked in place to provide a liquid back-up preventing further deflection of said plate.

4,693,122

METHOD AND APPARATUS FOR CALIBRATING A MATERIAL-SPREADING APPLICATOR

Charles A. Griffith, Rte. 5, Box E44, Ardmore, Okla. 73401

Filed Feb. 18, 1986, Ser. No. 830,226
Int. Cl.[4] G01M *19/00*; G01F *25/00*
U.S. Cl. 73—861 **5 Claims**



1. A method for calibrating an applicator of the type which uniformly spreads material on a surface as the applicator moves thereover, said method comprising the steps of:

determining the width of material spread by such an applicator in a single pass;

moving the applicator over the surface for a measured length;

catching the amount of material which the applicator would have spread over the surface while it was so moved;

weighing said caught material;

locating said width on a first nomograph scale;

locating said length on a second scale of said nomograph;

locating the weight per first unit area of said caught material on a third scale of said nomograph; and

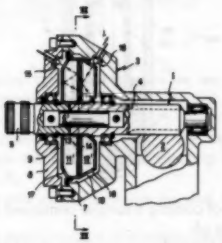
using lines through said located parameters on said first, second, and third scales to locate the weight applied per second unit area on a fourth scale of said nomograph.

4,693,123

ELECTRO-OPTICAL TORQUE SENSING DEVICE FOR AN ACTUATING MECHANISM

Juan S. Bacardit, Barcelona, Spain, assignor to Bendiberica S.A., Barcelona, Spain

Filed Mar. 11, 1986, Ser. No. 838,631
Claims priority, application Spain, Mar. 14, 1985, 541.703
Int. Cl.[4] G01L *3/12*
U.S. Cl. 73—862.33 **7 Claims**



1. A torque sensing device for an actuating mechanism, particularly for the steering or the steerable wheels of a vehicle, the mechanism comprising, in a casing, a primary rotary member which is intended to be connected to a control member, a secondary rotary member which is coaxial with said primary member and intended to be connected to an output member, an elastic torsion member which cooperates with said

primary and secondary members and allows relative rotation between the latter through a determined angular range on each side of a relative neutral position, and sensor means which is sensitive to the relative rotation between said primary and secondary members so as to provide a corresponding electrical signal, characterized in that the sensor means comprises first and second rotating structures which are rotatably fixed to said primary member and secondary member, respectively, and which comprise zones which are capable of rotating in the vicinity of one another and relative to one another, each zone of each rotating structure comprising a series of optical windows which are angularly spaced and arranged in such a way that each window is capable of crossing a light path between a light source and at least one photo-electric detector of proportional type, said windows of each series being arranged in such a way that in said relative neutral position two corresponding windows each belonging to respective series partially overlap in said light path, the rotating structures comprising two discs which are parallel and axially adjacent, said discs situated in a chamber of said casing, said light source and detector communicating optically with opposite axial zones, respectively, of the chamber, each disc made of a translucent material and comprising an outer axial surface and an inner axial surface which are coated with a layer of an internally reflective opaque coating, said inner axial surfaces of said two discs being adjacent, said windows being formed in said coating of said inner axial surfaces, and said outer axial surfaces each having an annular zone which is not coated and which is adjacent the respective zone of said chamber.

4,693,124

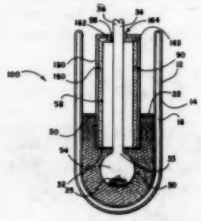
TEMPERATURE CONTROLLING APPARATUS FOR USE WITH PORE VOLUME AND SURFACE AREA ANALYZERS

Graham R. Killip, Doraville; Ronnie W. Camp, Duluth, and Clyde Orr, Jr., Dunwoody, all of Ga., assignors to Micromeritics Instrument Co., Norcross, Ga.

Filed Feb. 25, 1986, Ser. No. 833,079

Int. Cl.[4] G01N *1/28*

U.S. Cl. 73—863.11 **33 Claims**



1. A method of cooling a sample contained in a vessel, comprising the steps of:

immersing said vessel in a container of volatile cooling liquid with a portion of said vessel extending above the surface of said liquid; and

conducting said liquid from a location at or below the surface of said liquid in said container along said vessel to a predetermined point along the length of said vessel, said point being above the surface of said liquid, regardless of changes in the level of the surface of said liquid.

4,693,125

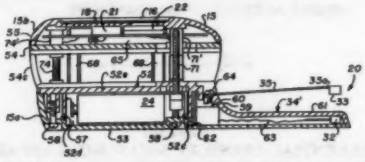
FORCE DETECTING AND INDICATING APPARATUS FOR FISHING RODS

Gary W. Krutz, West Lafayette, and James W. Kruse, Fort Wayne, both of Ind., assignors to Outdoor Electronics, Ltd., West Lafayette, Ind.

Filed Oct. 8, 1985, Ser. No. 785,579

Int. Cl.[4] A01K *97/12*; G01L *5/10*

U.S. Cl. 73—862.39 **23 Claims**



1. Apparatus for detecting and measuring forces on a fishing rod due to pull on a fishing line attached to the rod or to weight hanging on the rod, comprising:

transducer means for detecting the deflection of the fishing rod caused by forces on the fishing rod and providing analog signals representative of such forces;

signal conditioning means coupled to said transducer means for converting the analog signals to digital signals;

digital signal processing means coupled to said signal conditioning means, and having receiving means for receiving said digital signals and computing means for computing the values of the forces on the fishing rod which are causing the deflection of the rod; and

user interface means including indicating means controlled by said signal processing means to provide an indication of at least a rod deflection condition and the maximum value of force detected due to such condition.

4,693,126

FEED ROLL FOR MATERIAL WEB TRANSPORTING AND MEASURING WEB TENSION

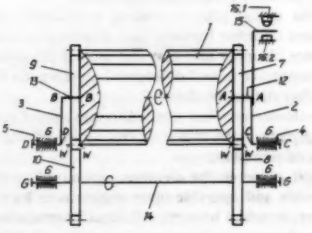
Dietrich Hank, and Kerstin Hauer, both of Leipzig, German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed May 8, 1986, Ser. No. 862,307

Claims priority, application German Democratic Rep., Jul. 26, 1985, 2790132

Int. Cl.[4] G01L *5/10*

U.S. Cl. 73—862.48 **4 Claims**



1. In a feed roll for transporting a material web and measuring a tension of a continually movable material web, the feed roll being in contact with an outer surface of the web due to the web tension and wrapping of the web around the roll the improvment comprising two levers (2,3) each positioned at one side of the feed roll so that the feed roll is rotatably and friction-free supported in said levers; said levers being pivotally supported in a machine frame and having axes of rotation

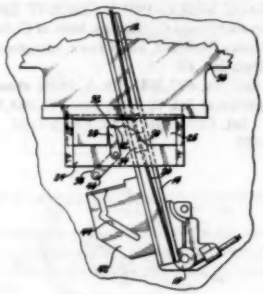
(C—C, D—D) which lie on the same straight line and extend through a point of action of a pulling force (F_D) of a portion of the movable material web the web tension of which is not measured and also through a point on a line of action of all resulting drive forces for the feed roll; means for returning said levers to initial positions; and a measure value-receiver (16) corresponding to at least one of said levers and rigidly arranged in the machine frame, said measure value-receiver measuring an amount of pivoting of said at least one lever, proportional to the web tension in a running portion of the movable material web.

4,693,127

DUAL CAM WINDOW REGULATOR APPARATUS AND METHOD

Mark C. Alty, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 23, 1986, Ser. No. 877,644
Int. Cl.[4] F16H *25/12*; E05F *11/48*
U.S. Cl. 74—25 **15 Claims**



1. A vehicle window regulator for regulating a window, said regulator comprising in combination:

a drive member;

a drive member guide structure;

means for imparting a reversible linear movement of said drive member along said guide structure;

a first plate for attachment to said window having a first cam surface;

a first plate mounting means attached to said drive member allowing relative motion between said drive menber and said first plate;

a first cam lever pivotally attached with said first plate mounting means for engagement with said first cam surface;

a second cam lever operatively connected with said first cam lever;

and a second cam surface for engagement with said second cam lever being fixed with respect to said drive member guide structure whereby the window is lifted at a variable rate with respect to said drive member.

4,693,128

APPARATUS FOR CONVERTING LINEAR MOTION TO ROTARY MOTION

Arthur E. Plow, Ponchatoula, La., assignor to T K Valve & Manufacturing, Inc., Hammond, La.

Continuation of Ser. No. 663,316, Oct. 22, 1984, abandoned.
This application Apr. 11, 1986, Ser. No. 851,882
Int. Cl.[4] F16H *25/24, 21/44*
U.S. Cl. 74—104 **10 Claims**

1. An apparatus for converting linear motion to rotary motion comprising:

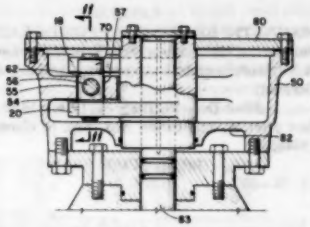
a housing generally circular in shape and having a top and a bottom;

a rib in said housing, said rib having a single elongated rib slot therein with opposite walls;

yoke assembly having a hub and an upper pair of arms and a lower pair of arms extending outwardly from said hub;

a drive screw having two ends and extending through said rib slot, each said end being supported by said housing;

a drive nut on said screw and positioned in said rib slot, said



drive nut having an upper and a lower roller, said upper roller positioned in a slot between said upper pair of arms and said lower roller positioned in a slot between the said lower arms;

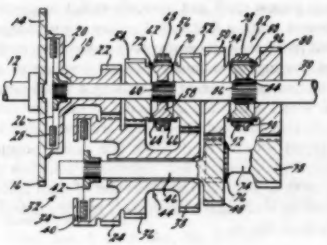
said drive nut being in sliding contact with the walls of said rib slot such that said rib resists any lateral force on said drive screw generated by the force between the yoke assembly and the drive nut.

4,693,129

COUNTERSHAFT AUTOMATIC TRANSMISSION

Stanley L. Pierce, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 25, 1984, Ser. No. 624,317
Int. Cl.[4] F16H *3/08*
U.S. Cl. 74—333 **6 Claims**



1. A multiple speed ratio transmission for use in delivering torque from an engine comprising:

an output shaft;

an input pinion continuously driven by the engine;

first clutch means for selectively connecting the engine to the output shaft;

a countershaft mounted for rotation parallel to the output shaft;

gearing defining multiple pairs of meshing gears and pinions including a first group of such pairs having the gears rotatably mounted on the output shaft and the pinions formed integrally with a gear wheel, said pinions being rotatably mounted on the countershaft and driven from the input pinion, said gearing further includes a second gear-pinion pair having the gear of said second gear-pinion pair rotatably mounted on the output shaft and the pinion of said second gear-pinion pair non-rotatably connected to the countershaft;

second clutch means for selectively driveably connecting the input pinion to the countershaft;

first coupler means for selectively driveably connecting the gear of a gear-pinion pair of the first group to the output shaft; and

second coupler means for selectively driveably connecting the gear of the second gear-pinion pair to the output shaft.

4,693,130

MAGNETIC BEARING SUPPORT GEAR TRAIN

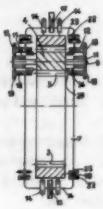
Joachim Kotzur, Oberhausen, Fed. Rep. of Germany, assignor to M.A.N.Maschinenfabrik Augsburg-Nürnberg AG, Fed. Rep. of Germany

Filed Dec. 18, 1985, Ser. No. 810,653

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1984, 3446211

Int. Cl.[4] F16H *35/06*

U.S. Cl. 74—397 **6 Claims**



1. A gear train comprising a gear case, a central wheel having a toothed circumference and mounted for rotation about a central axis in said gear case, a plurality of toothed pinion spaced around and engaged with said central wheel for rotation with rotation of said central wheel and to hold said central wheel centrally on its central axis, said tooth pinion each having a pinion shaft, first radial magnet bearings receiving each pinion shaft and exerting radial magnetic forces on each pinion shaft, a first radial sensor connected to each said first said radial magnet bearings for controlling each first radial magnet bearing to maintain a radial position of each pinion shaft, second radial sensor for sensing a radial position of said central wheel and being connected to said first radial magnet bearings, said first radial bearings are controlled by said first and second sensors to displace the radial position of each respective pinion shaft for maintain a selective spacing between teeth of said central wheel and of each pinion whereby said spacing is changable to correct for circumferential forces and for heat forces.

4,693,131

FEEDING APPARATUS EMPLOYING BALL SCREW

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-Ku, Tokyo, Japan

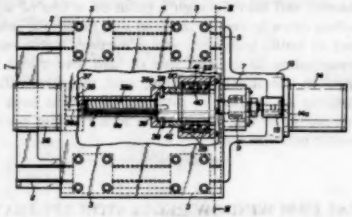
Filed Jun. 11, 1985, Ser. No. 743,698

Claims priority, application Japan, Jun. 13, 1984, 59-119786

Int. Cl.[4] F16H *25/22*

U.S. Cl. 74—424.8 B **1 Claim**

1. In a feeding apparatus employing a ball screw and ball nut assembly for moving a table axially movably supported on a fixed bed, said apparatus comprising a ball screw supported at one end thereof by the fixed bed in a rotatable and axially immovable manner, a ball nut mounted on said ball screw through balls and supported by said table in an axially immovable manner, and a first drive source mounted on the bed to rotate the ball screw, the improvement in which said ball nut is rotatably supported by said table and a second drive source means mounted on said table for directly rotating said ball nut through a hollow shaft directly receiving the other end of said ball screw so that a fine feed and coarse feed of said table is



provided solely by the separate drive of said ball screw and said ball nut.

4,693,132

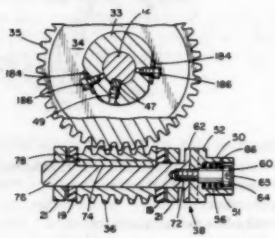
DRIVE MECHANISM FOR DRAWOUT HIGH AMPERAGE MULTI-POLE CIRCUIT BREAKER

Clifford A. Buxton; David C. Higgins, both of Cedar Rapids, and Gary A. Volesky, Newhall, all of Iowa, assignors to Square D. Company, Palatine, Ill.

Division of Ser. No. 697,355, Feb. 1, 1985, abandoned. This application Jul. 8, 1986, Ser. No. 883,251

Int. Cl.[4] F16H *1/16*; F16D *7/04*

U.S. Cl. 74—425 **5 Claims**



1. An improved drive mechanism for a worm gear mounted on a shaft to rotate the shaft about its longitudinal axis in response to operation of said drive mechanism with stop means provided to stop rotation of said shaft at a predetermined position, said mechanism comprising:

a worm operably positioned to turn said worm gear;

a driver shaft assembly including a first head having a top portion, a bottom surface and a central aperture extending longitudinally through said head, a ridge having side walls extending outward from said bottom surface and converging toward each other;

a driver shaft connected to said worm to rotate said worm in response to rotation of said driver shaft, said driver shaft having a second head engaging said bottom surface of said first head and including portions defining a channel shaped and dimensioned to nestingly receive said ridge; and

biasing means for connecting said first head to said second head and biasing said first head towards said second head to transfer rotational movement of said first head to said driver shaft through rotation of said ridge within said channel while permitting said ridge to withdraw from said channel in response to substantially predetermined torque being applied to said first head, said second head including a threaded aperture and said biasing means comprising a shoulder screw having a third head of a specified diameter, a central shaft portion having a lesser diameter than said third head and a threaded shaft portion, and a coil

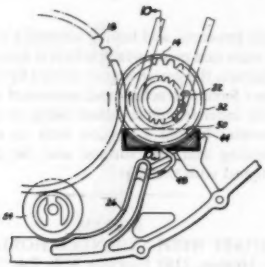
spring retained in said aperture of said first head about said central shaft portion and retained within said first head by said third head of said screw.

4,693,133

NOISE REDUCTION IN GEAR TRANSMISSION

Takao Tomita, and Noriaki Kawai, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 1, 1983, Ser. No. 499,879
Claims priority, application Japan, Jun. 18, 1982, 57-104718; Jun. 18, 1982, 57-91034[U]
Int. Cl.[4] F16H *57/04*
U.S. Cl. 74—467 7 Claims



1. A lubricated gear system in a vehicle transmission comprising:

first and second gear wheels including hubs rotatable about spaced, parallel axes and having gear teeth about the periphery of each of said hubs adapted for mutual meshing engagement;

means forming a wall on each side of said gear teeth substantially closing the spaces between adjacent gear teeth about the periphery of said first gear wheel, said means being sufficiently radially extensive to overlie the ends of the gear teeth on both of said gear wheels in th region of their meshing engagement;

a sump containing a body of fluid lubricant disposed subjacent said second gear wheel and whereby the lower peripheral region of said second gear which is immersed in said sump;

a vessel separate from and elevated above said sump in subjacent relation to said first gear wheel and forming an enclosure about the lower peripheral region of said first gear wheel which enclosure extends to a point in close proximity to the region of meshing engagement between the teeth of the respective gear wheels;

means for forming a lubricant supply tube penetrating said vessel and adapted to discharge lubricant directly on the teeth of said first gear wheel; and

a pump operatively connected between said sump and said lubricant supply tube for supplying lubricant from said sump to said supply tube.

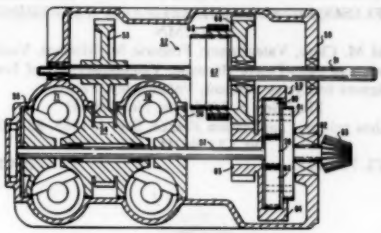
4,693,134

HIGH-POWERED VEHICLE DRIVE TRAIN

Charles E. Kraus, Austin, Tex., assignor to Excelermatic Inc., Austin, Tex.

Filed Jun. 20, 1985, Ser. No. 746,643
Int. Cl.[4] F16H *37/06, 15/08*
U.S. Cl. 74—690 3 Claims

1. A vehicle comprising: an engine having an infinitely variable transmission operatively coupled thereto for transmitting engine power to the transmission's input shaft, with the transmission output shaft being operatively connected to the vehicle's drive wheels, said transmission comprising a planetary drive structure including a drive ring gear carrying a first gear in engagement with a drive gear on said input shaft for rotation of said drive ring gear with said input shaft, a central sun gear and planetary gear members disposed in the annular space between, and in engagement with, said drive ring gear and said sun gear and rotatably supported on a planetary carrier which is supported for rotation with the transmission output shaft and an infinitely variable toroidal traction roller transmission structure including two parallel toroidal transmissions having a central input toric disc structure common to both toroidal transmissions and operatively connected to said input shaft, the output toric discs being mounted on a shaft associated with the sun gear of said planetary drive, each of said two parallel toroidal transmissions having oppositely disposed toroidal traction discs with traction rollers pivotally supported therebetween and in engagement therewith for the transmission of



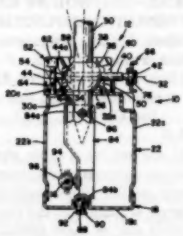
motion in opposite directions of rotation and at a transmission ratio which depends on the pivot position of said traction rollers, said input shaft being supported parallel to and spaced from the output shaft and said input toric disc structure being provided with a second gear in engagement with a third gear on said input shaft for rotation therewith and the output toric discs being operatively connected to said sun gear for driving said sun gear in a direction opposite to that of said ring gear and at a speed which depends on the pivot position of said traction rollers for controlling the orbit speed of said planetary gears and, together therewith, of said output shaft, said drive gear being rotatably mounted on said input shaft and provided with a clutch allowing selective engagement of said drive gear with said input shaft for rotation therewith, said drive gear also having braking means for locking said drive gear.

4,693,135

MANUALLY OPERABLE GEARSHIFT MECHANISM

William J. LaRocca, Sterling Heights, and David M. Trush, Warren, both of Mich., assignors to Wickes Manufacturing Company, Southfield, Mich.

Filed Jun. 5, 1986, Ser. No. 870,997
Int. Cl.[4] G05G *7/00*
U.S. Cl. 74—473 R 27 Claims



1. A manually operable gearshifting mechanism for displacing a pair of transmission gear actuators comprising support

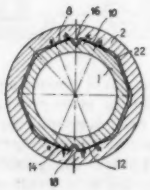
means, a gearshift lever, means mounting said gearshift lever on said support means for pivotal movement about first and second orthogonal axes, means to reciprocate one of said gear actuators in response to pivotal movement of said gearshift lever about said first axis, pin means on said gearshift lever parallel to said first axis, and means actuated by said pin means to reciprocate the other of said gear actuators in response to pivotal movement of said gearshift lever a given angular distance about said second axis, said means to reciprocate said one gear actuator including means responsive to said pivotal movement of said gearshift lever said given angular distance about said second axis to restrain displacement of said one gear actuator to an angular distance less than said given angular distance, said displacement of said one gear actuator being laterally of the direction of reciprocating movement thereof.

4,693,136

TELESCOPIC SUB-ASSEMBLY FOR A STEERING COLUMN

Michel M. Clerc, Valentigney; Frederic M. Mouhot, Voujeaucourt, and Jean-Pierre Barnabé, Valentigney, all of France, assignors to Cycles Peugeot, Valentigney, France

Filed Sep. 5, 1986, Ser. No. 903,931
Claims priority, application France, Sep. 6, 1985, 85 13283
Int. Cl.[4] B62D *1/18*
U.S. Cl. 74—492 **11 Claims**



1. Telescopic sub-assembly for a steering column comprising an outer hollow shaft, an inner shaft having an end portion which is a force fit inside an end portion of the outer shaft, said end portion of the outer shaft and said end portion of the inner shaft having respectively an inner surface and an outer surface which defines a bore, each of which surfaces has a cross-sectional contour defining two diametrically opposed generally corner-shaped portions extending longitudinally of the respective shaft and two substantially planar narrow surfaces respectively adjoining opposite sides of each corner-shaped portion in narrow zones of the respective surface and extending longitudinally of the respective shaft, said fit occuring between said substantially planar surfaces of the inner shaft and outer shaft in said narrow zones, said inner surface and said outer surface defining a clearance therebetween in the rest of the contour thereof.

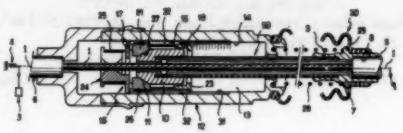
4,693,137

MECHANICAL CONTROL BY CABLE WITH AUTOMATIC ADJUSTMENT

Jean Deligny, Le Mans, France, assignor to Société des Câbles du Mans, Le Mans, France

Filed Feb. 6, 1986, Ser. No. 827,129
Claims priority, application France, Feb. 13, 1985, 85 02047
Int. Cl.[4] F16C *1/22*
U.S. Cl. 74—501.5 R **8 Claims**

1. A mechanical control by a cable sliding in a sheathing conduit, comprising an automatic adjustment device including a releasable locking device interconnecting selectively and firmly together during actuation of the mechanical control an outer ferrule structure and an inner ferrule structure which is fixed firmly to one end of the conduit and housed telescopically in the outer ferrule structure, the ferrule structures biased axially apart relative to one another, the locking device comprising disengageable, radially expandible locking means arranged between the inner and outer ferrule structures and adapted for cooperation with a cam surface formed on one of said ferrule structures and movable between a locked position interconnecting firmly together the ferrule structures and an unlocked position under the action of a control member engaging frictionally the cable, said locking means comprising at least one jaw structure having externally at least one tooth to cooperate with indentations formed in an inside wall of the



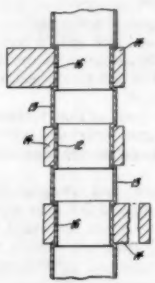
outer ferrule structure, and having internally a ramp surface to cooperate with said cam surface which is formed on the inner ferrule structure, the jaw structure carried by a cage surrounding the inner ferrule structure and associated with the control member, the inner ferrule structure being an end body of enlarged diameter having a portion with an external conical surface forming said cam surface, and the control member formed integral with the cage.

4,693,138

CAM SHAFT WITH EXPANDED HOLLOW SHAFT

Robert W. Hughes, 2155 Fourteen Mile Rd., Sterling Heights, Mich. 48077; Robert H. Brisson, 28078 Alger, and Glenn R. Brisson, 31632 Meadows, both of Madison Heights, Mich. 48071

Filed Dec. 31, 1985, Ser. No. 815,250
Int. Cl.[4] F16H *53/00*
U.S. Cl. 74—567 **1 Claim**



1. A camshaft (**10**) having lobes (**14**) with irregularly shaped apertures spaced along the longitudinal axis of a hollow tubular shaft (**12**), said lobes (**14**) orientated radially and axially in predetermined positions along the hollow tubular shaft (**12**), said camshaft (**10**) characterized by said walls of said hollow shaft (**12**) expanded outwardly into aperture portions in irregular engagement with the interior of said apertures of said lobes (**14**) and said walls expanded outwardly radially farther into ballooned portions between adjacent lobes (**14**) to create corresponding outside and inside shoulders extending between said aperture and ballooned portions, said outside shoulders being disposed immediately adjacent and abutting each side of said lobes (**14**) circumferentially about said apertures therein to secure said lobes (**14**) axially upon said shaft (**12**), said inside shoulders disposed directly opposite said outside shoulders to that said shoulder extend annularly about each end of each of said apertures and said ballooned portions extend between shoulders at adjacent lobes, the exterior circumferences of the lobes (**14**) being finished to closer tolerances than the interior

apertures and the exterior surfaces of the lobes (14) being positioned radially relative to the longitudinal axis with the radial positions of the interior apertures being offset among adjacent lobes (14).

4,693,139

CONNECTING ROD OF RECIPROCATING MOTION SYSTEM AND METHOD FOR PRODUCING THE SAME

Masato Mukai, Saitama, and Koichi Komatsu, Shizuoka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1985, Ser. No. 775,987

Claims priority, application Japan, Sep. 14, 1984, 193229

Int. Cl.[4] G05G 1/00

U.S. Cl. 74—579 E **3 Claims**

1. An internal combustion engine connecting rod including a larger diameter end portion which has a bearing hole made therein and is broken and divided into a body side bearing half and a bearing cap, with a bearing metal incorporated in said bearing hole, said body side bearing half and said bearing cap being integrally connected to each other by connecting bolts, wherein chamfers are made in the semicircular bearing surfaces of said body side bearing half and said bearing cap along broken and divided surfaces, respectively, of the bearing half and cap, each of said chamfers being made in the form of two stepped surfaces and including a first inclined surface close to said broken and divided surface and a second inclined surface close to said bearing surface, said first inclined surfaces of said chamfers together forming a first angle with respect to said divided surfaces and said second inclined surfaces of said chamfers together forming a second angle with respect to said divided surfaces, with said first angle being smaller than said second angle.

4,693,140

HOLLOW TUBULAR MEMBERS AND A METHOD OF MAKING SUCH MEMBERS

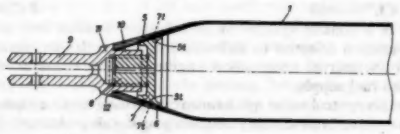
Walter A. Stephan, Braunau, and Josef Knauseder, Aurolzmünster, both of Austria, assignors to Fischer Gesellschaft M.B.H., Ried im Innkreis, Austria

Continuation of Ser. No. 528,154, Aug. 31, 1983, abandoned. This application Oct. 28, 1986, Ser. No. 925,529

Claims priority, application Austria, Sep. 7, 1982, 3337/82

Int. Cl.[4] G05G 1/00; F16C 7/00

U.S. Cl. 74—579 R **5 Claims**



1. A tube-shaped hollow member of fibre-reinforced plastic material suitable for the transmission of compressive, tensile, bending and torsional forces in vehicles comprising a central portion with a substantially circular-shaped cross-section integrally formed with hollow end regions which are tapered conically inward from the central portion, and a pair of connector means for transmitting forces to respective ones of the hollow end regions, wherein each of the pairs of connector means includes a screw-threaded clamping plate pressing against the conical internal wall of the respective hollow end region, and a one-piece connecting member for connecting the tube-shaped hollow member to another device, the one-piece connecting member including a screw-threaded sleeve which extends into the respective hollow end region and is screw-threadably mounted on the clamping plate, and the one-piece connecting member also including an integral circular collar which presses against an annular frontal surface of the respective hollow end region extending essentially transversely to a longitudinal axis of the respective hollow end region.

4,693,141

AUTOMATIC TRANSMISSION CASE

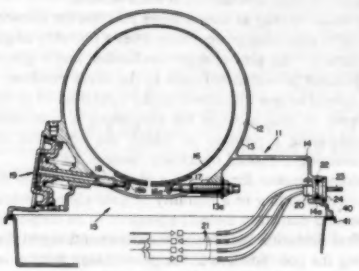
Kazuyoshi Iwanaga, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 595,523, Mar. 30, 1984, abandoned. This application Jan. 5, 1987, Ser. No. 4,241

Claims priority, application Japan, May 25, 1983, 58-78624

Int. Cl.[4] F16H 57/02

U.S. Cl. 74—606 R **3 Claims**



1. A combination comprising:

an automatic transmission case including a first wall defining a transmission chamber and a second wall integral with the first wall, said automatic transmission case being formed with a threaded first hole in said first wall, a band brake, a threaded anchor pin for said band brake being received in said threaded first hole, said anchor pin having a first end terminating within said transmission chamber, and a second end terminating between said first and second walls and a second hole which formed in said second wall and is arranged in alignment with said first hole; and

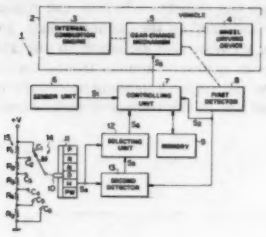
means for establishing an electrical connection passing through the second hole of the automatic transmission case in a liquid tight manner, the means including an electrical element received in said second hole and a seal between said electrical element and said second wall for sealably closing said second hole in a liquid tight manner.

4,693,142

AUTOMATIC TRANSMISSION SYSTEM FOR VEHICLES

Kazumasa Kurihara, Higashimatsuyama, and Kenji Arai, Higashimasyuyama, both of Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1986, Ser. No. 829,256
Claims priority, application Japan, Feb. 26, 1985, 60-35331
Int. Cl.[4] B60K *41/06*
U.S. Cl. 74—861 9 Claims



1. An automatic transmission system for vehicles powered by an internal combustion engine, comprising:

a gear-change mechanism connected to an internal combustion engine and adapted to operate in response to an electric signal;

means for outputting at least one condition signal indicative of an operating condition of the internal combustion engine at each instant;

a first detection means for detecting a gear position of said gear-change mechanism at each instant;

a selector having at least a drive position for allowing automatic gear-change operation over a plurality of gear positions of said gear-change mechanism and a gear-holding position provided adjacent to the drive position;

an output means responsive to the operation of an operation lever of said selector for outputting a command signal indicating a position at which the operation lever for selecting a desired operation mode is set;

a storage means for storing a plurality of sets of map data corresponding to a plurality of gear change maps;

a second detection means responsive to an output from said first detection means and the command signal for detecting the gear position of the gear-change mechanism at the time the operation lever is moved from the drive position to the gear-holding position;

a map selecting means responsive to the command signal and an output from said second detection means for selecting a predetermined set of map data corresponding to the command signal sorted in said storage means when the operation lever is in a position other than the gear-holding position and a set of map data corresponding to the output of said second detection means stored in said storage means when the operation lever is in the gear-holding position, said set of map data corresponding to the output of said second detection means being a gear change map data in which the maximum gear position is limited to that indicated by the result of the detection at that time by said second detection means; and

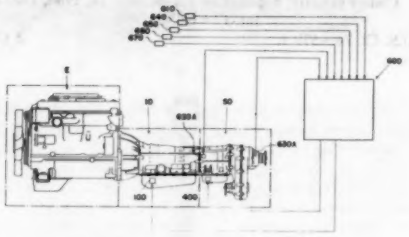
a control means responsive to the condition signal for controlling the operation of said gear-change mechanism in accordance with the set of map data selected by said map selecting means.

4,693,143

CONTROL DEVICE FOR AN AUTOMATIC TRANSMISSION SYSTEM

Yoshiharu Harada, Toyota; Yutaka Taga, Aichi; Kagenori Fukumura, Toyota; Yoichi Hayakawa, Toyoake, and Masao Kawai, Chiryu, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisin-Warner Kabushiki Kaisha, both of Aichi, Japan

Filed Jan. 21, 1986, Ser. No. 820,155
Claims priority, application Japan, Jan. 19, 1985, 60-07765
Int. Cl.[4] B60K *41/18, 37/00*
U.S. Cl. 74—866 4 Claims



1. A control device for an automatic transmission having a main transmission, a sub transmission connected to an output shaft of the main transmission, and electronic control means for controlling the speed changing ratios of the main and sub transmissions, wherein the electronic control means comprises:

means for inputting a signal representing a running state of a vehicle and controlling the speed changing ratios of the main and sub transmissions;

speed changing ratio detecting means for detecting the speed changing ratio of the sub transmission;

first output shaft speed detecting means for detecting the rotational speed of the output shaft of the main transmission;

second output shaft speed detecting means for detecting the rotational speed of the output shaft of the sub transmission;

means for adjusting a signal of the second output shaft speed detecting means when the speed changing ratio detecting means judges that the speed changing ration of the sub transmission is in a reduced speed range; and

means for effecting speed change control of the main transmission by selecting either a signal of the first output shaft speed detecting means and the signal of the second output shaft speed detecting means as a result of comparison between the signal of the first output shaft speed detecting means and the signal of the second output shaft speed detecting means.

4,693,144

CONTROL VALVE SYSTEM FOR A CONTINUOUSLY VARIABLE BELT DRIVE

Ulrich Eggert, Cologne, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 641,236, Aug. 16, 1984, abandoned. This application Sep. 8, 1986, Ser. No. 904,826
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1983, 3333136
Int. Cl.[4] B60K *41/16*
U.S. Cl. 74—868 3 Claims

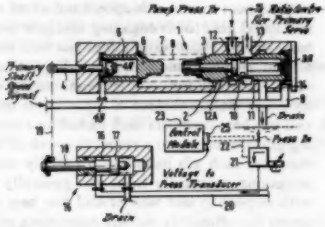
1. In a control system for an infinitely variable belt drive transmission adapted to deliver torque to a driven member from an internal combustion engine with an operator controlled fuel supply;

a ratio control valve mechanism comprising a valve element, a valve bore slidably receiving said valve element, first fluid pressure passage means for distributing a driving speed pressure signal to one end of said valve element, a

pressure inlet passage and a pressure outlet passage communicating with said valve bore, the outlet passage being adapted to communicate with a ratio control servo;

a force transmitting mechanism including a movable spring seat, valve springs between said spring seat and said valve element;

a secondary valve comprising a movable secondary valve element having a connection with said force transmitting mechanism, second fluid pressure passage means for distributing a pressure signal to said secondary valve element whereby the effective force acting on said ratio control mechanism can be controlled; and



an electronic control module adapted to store multiple engine torque and speed relationships with respect to a range of engine fuel supply parameters, said module being connected to said secondary valve element through said second pressure distributing means whereby the operator may select the desired stored relationship to effect either optimum fuel economy or optimum performance.

4,693,145

METHOD OF CONTINUOUSLY GRINDING THE TEETH OF SAW BANDS AND SAW BLADES

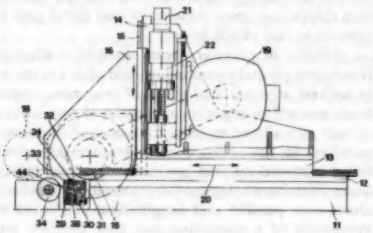
Harry Gustavsson, Halmstad, Sweden, assignor to AB Wedalco Centerless, Halmstad, Sweden

Filed Oct. 16, 1985, Ser. No. 788,115

Claims priority, application Sweden, Oct. 17, 1984, 8405176-2

Int. Cl.[4] B23D *63/12, 65/00*

U.S. Cl. 76—112 **4 Claims**



1. Method of continuously grinding the teeth of a number of adjacent saw bands out of the total band material, by a rotating, grinding wheel, reciprocatingly movable transversely to the longitudinal direction of the saw bands, said method comprising: adjusting the position of the grinding wheel, at the beginning of every reciprocating grinding movement, a predetermined amount corresponding to the wear of the grinding wheel after one grinding cycle; passing the grinding wheel on its way towards the band material by a stationary abrasing wheel for the re-shaping of the grinding wheel; effecting step-by-step movement of the saw bands by the return stroke of the grinding wheel to its initial position, after the second passage of the grinding wheel past the saw bands, whereby the grinding wheel once more passes the abrasing wheel.

4,693,146

METHOD AND APPARATUS FOR ACHIEVING CHIP SEPARATION WHILE MACHINING WORK PIECES

Theodor Dombrowski, Erkelenz, and Hartwig Klosterhalfen, Dueren, both of Fed. Rep. of Germany, assignors to Wilhelm Hegenscheidt Gesellschaft mbH, Erkelenz, Fed. Rep. of Germany

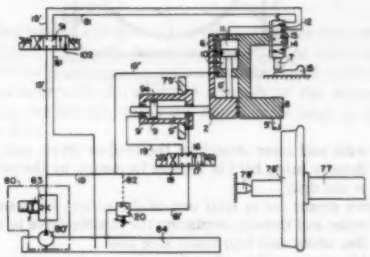
Division of Ser. No. 842,812, Mar. 21, 1986, Pat. No. 4,667,546.

This application Dec. 24, 1986, Ser. No. 946,585

Claims priority, application European Pat. Off., Apr. 9, 1985, 85104285.3

Int. Cl.[4] B23B *3/28, 5/30*

U.S. Cl. 82—2 B **16 Claims**



1. An apparatus for turning a work piece, comprising work drive means for rotatably supporting a work piece, tool means for machining a work piece, movable tool support means for carrying said tool means in two directions perpendicular to each other, controllable drive means operatively connected to said tool support means for controlling the movement of said tool support means, and drive control means connected to said controllable drive means for causing said tool support means to follow oscillation movements in said perpendicular directions having a certain amplitude and frequency, said oscillation movements resulting in a tool oscillation movement along a feed advance line generated by feed advance vectors forming a work piece contour, said drive control means comprising means for adjusting said amplitude and said frequency of said oscillation movements of said tool support means for assuring chip breakage.

4,693,147

DRIVE MECHANISMS FOR ROTATING CRANKSHAFTS FOR USE IN MACHINE TOOLS

Raymond T. Shackleton, Keighley, United Kingdom, assignor to Butler Newall Machine Tool Company Limited, West Yorkshire, United Kingdom

Filed Dec. 19, 1985, Ser. No. 810,599

Claims priority, application United Kingdom, Mar. 22, 1985, 8507580

Int. Cl.[4] B23B *31/00, 5/22*

U.S. Cl. 82—40 A **8 Claims**

1. A drive mechanism for rotating a crankshaft so that the crankshaft, when oriented such that its axis of rotation is horizontally oriented, can be operated on by a machine tool, said crankshaft including a throw, the drive mechanism comprising:

a disc for rotation about a horizontal axis to coincide with the horizontal axis of said crankshaft;

a radial slot extending into the disc from an outer peripheral part thereof to receive said throw of said crankshaft to rotate the crankshaft with rotation of the disc;

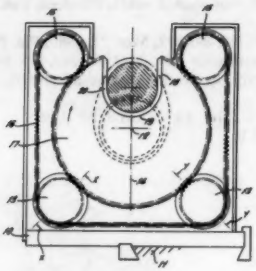
a plurality of rollers;

means to mount the rollers in an arc extending around said

horizontal axis of rotation of the disc but not directly above said axis;

an endless flexible drive extending around the arcuately spaced rollers with an inner stretch of the drive engaging the inner sides of the rollers with respect to said horizontal axis and an outer stretch of the drive engaging outer sides of the rollers with respect to said axis;

said disc having a peripheral part in driving engagement



with said inner stretch of the endless drive, said stretch thereby being held in arcuate formation by the periphery of the disc;

drive means for at least one of the rollers for turning the roller and thereby displacing the flexible drive to turn the disc about said horizontal axis; and

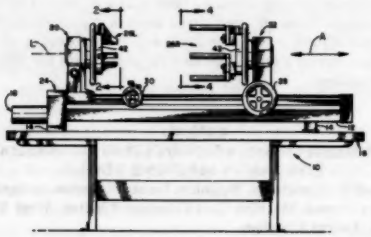
guide means on the rollers for engaging the periphery of the disc to restrain the disc against axial movement with respect to said rollers.

4,693,148

GLASSWORKING SCROLL CHUCK WITH INTERCHANGEABLE JAWS

David M. Lobley, Quakertown, Pa., assignor to Andrew J. Wargo, Hellertown, Pa.

Filed Jun. 20, 1986, Ser. No. 876,833
Int. Cl.[4] B23B *31/02*
U.S. Cl. 82—40 R **32 Claims**



26. A lathe especially adapted for glassworking, comprising:

a. a longitudinally elongated frame;

b. a pair of upright members, mounted on said frame and extending upwardly therefrom, each upright member retaining inwardly facing chucks for holding longitudinally extending generally tubular workpieces therein;

c. a motor;

d. means for transmitting rotational motion from said motor output shaft to said inwardly facing chucks for rotating said chucks and a workpiece held therebetween;

e. at least one of said chucks comprising:

1. chuck body means rotatably driven about a longitudinal axis by said rotational motion transmitting means;

2. a handwheel, rotatable about said longitudinal axis;

3. means for releasably coupling said handwheel to said chuck body for unitary rotation of said handwheel with said chuck body;

4. said handwheel including a longitudinally projecting continuous spiral gear tooth defining a path of spiral movement relative to said axis upon rotation of said handwheel;

5. a plurality of generally radially disposed jaw base members, each having generally I-beam--like radial cross-section, each including spiral gear grooves on the base for meshingly engaging said spiral gear tooth, evenly angularly spaced about said axis and movable radially with respect to said axis upon handwheel rotation with said spiral gear tooth engaging said gear grooves on the bases of said I-beam configured jaw base members; each of said jaw base members including an axially facing surface adapted for complemental mating with a corresponding mating surface of a jaw outer member;

6. said jaw base members each including a radially extending gib connecting to a respective web of said jaw base member, each gib including a radially extending rack projecting outwardly from and generally transversely with respect to said web of said jaw base member;

7. means for adjustably radially positioning said gibs along the length of said webs of said I-beam-- configured jaw base member;

8. means for adjustably longitudinally positioning said gibs along the height of said webs in said longitudinal direction;

9. said outer jaw members having mating surfaces formed for complemental mating with said jaw base member mating surfaces, being adapted to be removably connected to said jaw base members and including longitudinally extending heat-resistant surfaces adapted for contactingly engaging a glass workpiece upon radial covergence of said jaw base members with resultant radially converging closure of said outer jaw members thereabout;

10. means for retaining said outer jaw members in removable connection with said jaw base members at said respective mating surfaces;

11. said chuck body means facing said spiral gear tooth and being rotatable about said axis independently of said heandwheel, for retaining said spiral grooves of said jaw base members in meshing engagement with said spiral gear, including radially extending slots having said web portions of said jaw base members resident therein facilitating radial travel of said jaw base members therealong upon rotation of said spiral gear tooth relative to said chuck body;

12. a plurality of planetary beam assemblies adapted for removable pivotal mounting on said chuck body means in sockets adjacent said racks of said gibs, respective beam assemblies engaging said racks of respective ones of said gibs affixed to respective ones of said jaw base members in the absence of said outer jaw members being mounted on said jaw base members, respective beam assemblies being movable rotatably in said sockets about axes parallel said longitudinal axis upon radial movement of a respective jaw base member and its associated gib engaged by said beam assembly responsively to rotation of said handwheel, each planetary beam assembly including:

i. a pivot pin adapted for mounting engagement within one of said sockets to define an axis of rotation of a pinion gear portion of said beam assembly;

ii. a pinion gear rotatable relative to and about said pivot pin and adapted to meshingly engage a radially extending rack of a respective gib affixed to an adjacent jaw base member;

iii. an arm disposed generally transversely with respect to said longitudinal axis and rotatable with said pinion gear about said pivot pin;

iv. a jaw rod extending from said arm member parallal

to said longitudinal axis and adapted to secure a workpiece upon rotating closure of said arms about said work piece unitarily with rotation of said pinion gear responsively to rotary movement of said handwheel relative to said chuck body and resultant radial movement of said jaw base member and a gib rack engaging said pinion gear, and

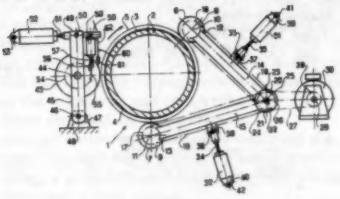
13. means for selectably releasably retaining said planetary beam assemblies in engagement with said sockets with said pine resident within said sockets.

4,693,149

DEVICE FOR THE AUTOMATIC CUTTING OF CARDBOARD AND OTHER TUBES

Georges Sireix, 9, rue Saint-Marc, 68400 Riedisheim, France

Filed Jun. 4, 1985, Ser. No. 740,958
Claims priority, application France, Jun. 8, 1984, 84 09176
Int. Cl.[4] B23B *5/14*
U.S. Cl. 82—53.1 **8 Claims**



1. A device for automatically cutting freshly formed circular tubes comprising: a fixed cylindrical mandrel for freely turnably supporting thereon a freshly formed circular tube which is to be cut; means for supporting said mandrel, drive means for rotationally driving the circular tube so that it rotates around the fixed mandrel, the drive means comprising two rotatable counter-rollers disposed in angularly spaced relation about the fixed mandrel and extending lengthwise of the fixed mandrel, means for urging the counter-rollers against the circular tube, and means for rotationally driving the counter-rollers while the same are urged against the circular tube to thereby effect rotation of the circular tube around the fixed mandrel and cutting means for cutting the circular tube while the same is rotating, the cutting means comprising a rotatable circular knife having a peripheral cutting edge, and means for movably supporting said knife for moving said knife through a cutting range in which the knife cutting edge coacts with the fixed mandrel to effect cutting of the circular tube along a cut line and a non-cutting range in which the knife cutting edge is spaced from the fixed mandrel, means for restraining the knife from rotating while in said cutting range, said restraining means comprising a rachet wheel connected to the knife for movement therewith, and a pawl engageable with the ratchet wheel to hold the ratchet wheel and hence the knife against rotation, and means for actuating said pawl to effect incremental angular displacement of said ratchet wheel and knife while the knife is in the non-cutting range.

4,693,150

PAPER CUTTING ATTACHMENT

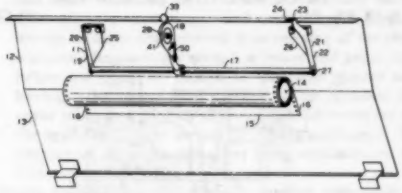
William Barclay, 2042 Whitefield, Dearborn Heights, Mich. 48127, and Alexander C. Stanis, Milan, Mich., assignors to William Barclay, Dearborn Heights, Mich.

Filed Jun. 28, 1985, Ser. No. 749,630
Int. Cl.[4] B26D *1/16, 3/16*
U.S. Cl. 82—93 **2 Claims**

1. Paper cutting attachment for a drum type computer plotting apparatus wherein paper is accumulated in a roll on a take-up drum and thereafter trimmed and divided by a user comprising in combination:

(a) a slender circular cross-shaft for mounting a paper cutter head at parallel spaced relationship to a take-up reel of a drum type plotting apparatus; and

(b) at least one paper cutter head mounted for rotation and translation on the cross-shaft having a housing with an aperture at one end for receiving a stepped bushing, a stepped bushing engaging said housing aperture, said



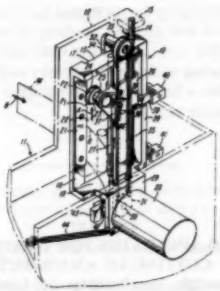
bushing having a groove at one end portion for receiving a retaining ring and a threaded aperture at the other end thereof for receiving a thumb screw and a thumb screw in engagement with the threaded aperture of the stepped bushing for laterally fixing the paper cutter head on the cross-shaft.

4,693,151

CUTTING METHOD AND APPARATUS FOR STACKER

Donald E. Goubeaux, Miamisburg, and Richard A. Miller, Cincinnati, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Jan. 9, 1985, Ser. No. 690,064
Int. Cl.[4] B65H *35/04;* B26D *1/60*
U.S. Cl. 83—23 **16 Claims**



13. Method of cutting and stacking record members, comprising the steps of: providing a cutting mechanism having a generally annular rotatable knife and an elongate knife in contact with the rotatable knife generally along a chord of the rotatable knife, moving the rotatable knife relative to the elongate knife, advancing a web into engagement with the moving knives and moving the knives as a unit together with the web solely by engagement of the knives while the rotatable knife is moving to sever a generally rectangular record member from the web, providing a stacker for accumulating a stack of tags, and wherein the knives sever a record member from the web while a portion of the web is in the stacker.

4,693,152

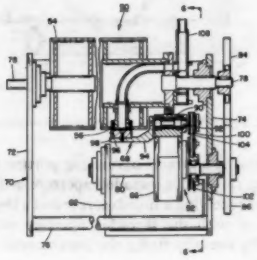
ROTARY TUBE PUNCHING ARRANGEMENT WITH TUMBLING PUNCH AND METHOD FOR PUNCHING HOLES INTO A FILM WEB

Edward G. Grosz, Sodus Point, and Fox J. Herrington, Holcomb, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 6, 1986, Ser. No. 871,334

Int. Cl.[4] B26D *7/14, 7/18;* B26F *1/08*

U.S. Cl. 83—24 **22 Claims**



13. A method for punching holes into a continuously advancing thermoplastic film web, comprising:

(a) advancing said film web over a rotatable anvil roll with said film web extending in surface contact with at least a portion of the circumference of said roll; at least one opening of predetermined size being formed in the circumferential surface of said anvil roll;

(b) causing a rotary punch having a serrated cutting edge at the radially outer end thereof to pierce said film web at right angles to the surface of said web and to enter said opening in said anvil roll at predetermined intervals at a substantially radial motion relative to the anvil roll;

(c) rotating a rotatable arm mounting said rotary punch while concurrently pivoting said rotary punch to effect the radial orientation of said punch while piercing the film web; and rotating said anvil roll in conjunction with the rotation;

(d) and synchronizing the rotational movements of said anvil roll and said arm and the pivoting of said rotary punch with said film web advancing over said opening on the anvil roll facing said punch whereby said serrated cutting edge punches a hole into said web while radially entering said opening in said anvil roll.

4,693,153

METHOD AND APPARATUS FOR CONTROLLING THE CUTTING OF AN OBJECT

Ronald C. Wainwright, Hertfordshire, and Lawrence R. Beesley, Essex, both of England, assignors to Gunson's Sortex Limited, London, England

Filed Jul. 17, 1985, Ser. No. 755,820

Claims priority, application United Kingdom, Jul. 27, 1984, 84 19185

Int. Cl.[4] B26F *3/00*

U.S. Cl. 83—53 **5 Claims**

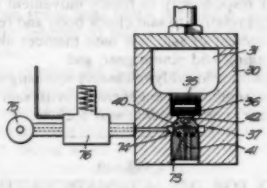
1. A method of controlling the cutting of an object comprising:

pressurizing a first fluid,

passing said pressurized first fluid through a nozzle to form a fluid jet adapted to cut the object;

directing said object-cutting jet towards the object and,

when it is not desired to cut the object, introducing into said nozzle a further fluid which prevents the formation of a jet capable of cutting the object, the introduction of the



further fluid into the nozzle being effected while maintaining the pressurization of the first fluid.

4,693,154

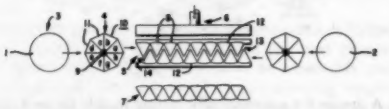
METHOD AND APPARATUS FOR DIVIDING AND FURTHER TREATMENT OF UNITS OF GOODS

Gösta Karlsson, Vimmerby, Sweden, assignor to B & D Autolines AB, Malmo, Sweden

Filed May 2, 1986, Ser. No. 858,819

Int. Cl.[4] A21C *15/04;* B26D *3/24*

U.S. Cl. 83—161 **1 Claim**



1. Apparatus comprising supporting means for supporting a large piece of material such as a cake while cuts are made in it along cutting lines that radiate from a point to divide it into a plurality of small units and to define on each such small unit a pair of convergent surfaces each of which opposes one of said convergent surfaces on an adjacent small unit, and shifting means cooperating with said supporting means for moving said small units into a side-by-side aligned relationship with one another wherein said surfaces of adjacent small units are spaced apart, said apparatus being characterized by:

A. said supporting means comprising a sector plate for each of said small units,

(1) each said sector plate having a top surface upon which its small unit rests and which has a pair of convergent side edges that correspond to adjacent cutting lines, and

(2) each said sector plate having an inner end towards which its said edges converge and an outer end remote from said inner end;

B. articulation means at said outer ends of the sector plates whereby they are so connected with one another as to comprise a chain having opposite ends and having one of said sector plates at each of said ends, said articulation means providing for swinging of the sector plates relative to one another and for maintaining their said top surfaces coplanar; and

C. said shifting means comprising

(1) actuating means connected with one of said sector plates for imparting motion to all of the sector plates in at least one direction transverse to their said edges and parallel to their sad top surfaces,

(2) guide follower means on each sector plate adjacent to said outer end thereof, and

(3) guide means engaged by said guide follower means, arranged to define a path which successive sector plates in said chain are constrained to follow as the sector plates are moved in said one direction and whereby the sector plates, collectively, are shifted between

(a) a starting position in which all of the sector plates have their said edges radial to said point and the

sector plates cooperate to support a large piece of material for cutting, and

(b) a terminal position in which the sector plates are disposed with their inner ends in spaced apart relation to one another along a substantially straight line.

4,693,155

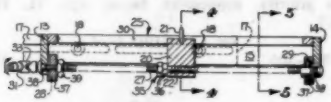
TABLE SAW ATTACHMENT FOR CUTTING CIRCLES

Hazen Ledford, Jr., 639 Church Rd., Bakersville, N.C. 28705

Filed Apr. 28, 1986, Ser. No. 856,656

Int. Cl.[4] B23D *55/04;* **B27B** *13/00*

U.S. Cl. 83—410 **8 Claims**



1. In an apparatus for cutting circles or other arcuate shapes from workpieces which includes cutting means for cutting the workpieces and a worktable, the improvement therein comprising attachment means for supporting workpieces of disparate size and shape for cutting without the necessity of prefashioning the workpiece and comprising

a frame mounted on said worktable,

a carriage mounting a workpiece centering pin,

means mounting said carriage on said frame for movement along a predetermined path of travel toward and away from said cutting means,

actuating means for moving said carriage along said path of travel in predetermined increments during cutting of a workpiece, and

adjustable stop means cooperating with said carriage mounting means for adjusting the length of said path of travel while concurrently permitting incremental movement of the carriage along the path of travel defined by said stop means whereby workpieces of disparate size and shape may be supported and precisely cut into circles or other arcuate shapes of predetermined dimensions without the necessity of prefashioning the workpieces.

4,693,156

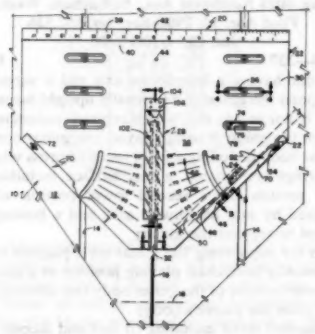
TABLE SAW ACCESSORY

Armando C. Olvera, 1126 E. Dewey, Alice, Tex. 78332

Filed Aug. 2, 1985, Ser. No. 761,859

Int. Cl.[4] B23Q *1/04;* **B27B** *25/08, 27/08*

U.S. Cl. 83—422 **11 Claims**



1. An accessory for use in combination with a stationary saw table having a generally horizontal upper surface providing at least two parallel grooves and a circular saw blade projecting upward through the horizontal surface parallel to the grooves, comprising

a plate having upper and lower surfaces, an elongate blade receiving slot through which the saw blade is extendible and a support receiving opening;

means carried by the plate and mounting the plate for movement on the table parallel to the saw blade, including

at least a pair of rollers parallel to the blade receiving slot and means mounting each the rollers for rotary movement about a vertical axis and comprising a support having an upper end received in an opening of the plate and providing a screw thread, a lower end projecting below the plate for receipt in the table groove and having a polygonal stud thereon, a lip between the upper and lower ends, a threaded fastener received on the upper end screw thread for rigidly captivating the support on the plate, the roller being rotatable on the lower end; and

means preventing rotation of the support comprising a link received on each of the studs; and

a work rail, on the upper surface of the plate, comprising a shoulder against which a work piece abuts, the work piece being extendible across the saw blade receiving slot.

4,693,157

CUTTING DEVICE

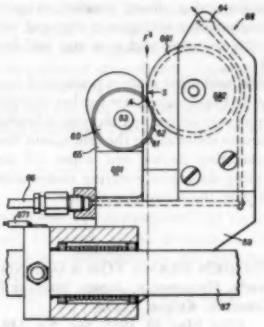
Gottlieb Looser, In der Finne 910, 9496 Balzers, Liechtenstein

Continuation of Ser. No. 298,632, Sep. 2, 1981, abandoned. This application Feb. 19, 1985, Ser. No. 703,216

Claims priority, application Switzerland, Sep. 16, 1980, 6911/80

Int. Cl.[4] B26D *7/06*

U.S. Cl. 83—431 **14 Claims**



1. A device for cutting a web of a predetermined thickness by a relative movement between said web and a cutting edge, comprising:

(I) an indexing blade consisting essentially of a steel sheet disk having

(a) a substantially uniform thickness of the order of magnitude of said predetermined thickness of said web to be cut and in the range of from about 10 micrometers to about 500 micrometers,

(b) a diameter directly varying in the range of from about 10 millimeters to about 100 millimeters with a variation in said substantially uniform thickness of the indexing blade in said range from about 10 micrometers to about 500 micrometers, and

(c) a substantially continuous cutting edge extending around the periphery of said steel sheet disk,

(II) an automatic indexing actuator in operative connection with said indexing blade, and

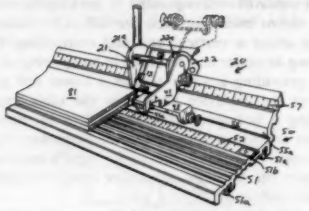
(III) a mounting means for holding said indexing blade in a web cutting position.

4,693,158

FENCE SYSTEM WITH A STOP MECHANISM

T. David Price, 648 Turin St., S. St. Paul, Minn. 55075

Filed Apr. 24, 1986, Ser. No. 855,844
Int. Cl.[4] B27B *27/10*
U.S. Cl. 83—468 **21 Claims**



1. A workpiece stop mechanism for use with a fence for power tools, the fence having a measuring device extending along the length of the fence, said mechanism comprising:

(a) a body member defining an opening for enabling said body member to be inserted on and removed from the fence and for sliding on the fence;

(b) said body member having a view plate cooperatively connected thereto for viewing the measuring device;

(c) means for stopping the workpiece, said stopping means cooperatively connected to said body member;

(d) means for securing said body member to the fence, said securing means comprising:

(i) a gate member pivotally mounted to said body member proximate said opening; and

(ii) means for pivoting said gate member between an open position and a closed position, wherein when in said closed position said gate is engaged with the fence and thereby securing said gate and said body to the fence; and

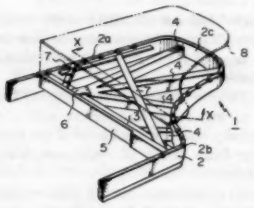
(e) wherein said view plate is positioned over the measuring device and said view plate further comprises a dust wiper cooperatively connected thereto, wherein when said stop mechanism slides along the fence, said dust wiper engages the measuring device and wipes off any dust, thereby preventing dust from entering under said view plate as it passes over the measuring device.

4,693,159

WOODEN FRAME FOR A GRAND PIANO

Ichiro Sawada, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed May 30, 1985, Ser. No. 739,363
Claims priority, application Japan, Jun. 8, 1984, 59-084209[U]; Feb. 27, 1985, 60-026299[U]
Int. Cl.[4] G10C *3/04*
U.S. Cl. 84—186 R **16 Claims**



1. A curved wooden frame for a grand piano, comprising:

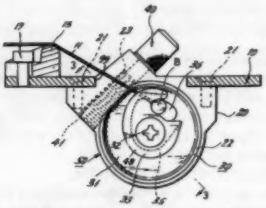
at least three interconnected sections, including a treble range section, a bass range section, and a middle range section, said bass range section and said treble range section comprising wooden material, the rigidity of the wooden material of said bass range section being greater than that of the wooden material of said treble range section, and said middle range section intervening said treble and bass range sections.

4,693,160

MECHANISM FOR TENSIONING STRINGS OF HEADLESS GUITARS

Yoshiki Hoshino, Owari Asahi, Japan, assignor to Hoshino Gakki Co., Ltd., Japan

Filed Feb. 11, 1986, Ser. No. 828,394
Claims priority, application Japan, Apr. 11, 1985, 60-053954[U]
Int. Cl.[4] G10D *3/14*
U.S. Cl. 84—306 **11 Claims**



1. String tensioning means for a musical instrument such as a guitar, said string tensioning means including:

an adjusting member, a control member and drive means interposed between said control member and said adjusting member for moving the latter by operating said control member;

said adjusting member including a holding portion for grasping a string at a first end thereof;

said adjusting member also including a tensioning portion which supports a string section adjacent a string first end that is being grasped by said holding portion; and

said string tensioning portion being operatively constructed so that for a given degree of operation for said control member, as magnitude string tension increases, rate of string tensioning decreases.

4,693,161

APPARATUS FOR SUPPORTING A MUSICAL INSTRUMENT

Ira J. Uhrig, 4015 Northwest Ave., Bellingham, Wash. 98226

Filed Apr. 14, 1986, Ser. No. 852,536
Int. Cl.[4] G10G *5/00*
U.S. Cl. 84—327 **15 Claims**

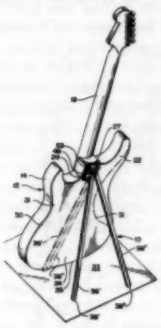
1. A guitar having a lengthwise axis and a support stand which supports the guitar in a generally upright manner when the guitar is not in use and which remains connected to the guitar when the guitar is being played, the guitar comprising:

a. a guitar body including a front surface across which playing strings are located, a rear surface including a first upper portion and a second lower portion which are separated by said lengthwise axis, and a bottom surface adapted to support the guitar;

b. means for supporting the guitar on a player's body in a substantially horizontal playing position in a manner that the lower portion of the guitar body rear surface is spaced away from the player's body;

c. said support stand including (i) first and second elongate support legs for engaging a supporting surface, (ii) first means for connecting said first and second support legs to said guitar body to permit pivotal movement of said support legs between a first position where said support legs

are spaced away from said guitar rear surface and a second position where said support legs are located adjacent to said guitar rear surface, and (iii) second means for connecting said first and second support legs to said guitar body in a manner to permit movement of said first asnd second support legs between a third position where said first and second support legs are spaced apart from each other at opposite sides of said lengthwise axis, and a fourth position where said first and second support legs are lo-



cated at a same side of said lengthwise axis, so that when said first and second support legs (i) simultaneously occupy the first and third positions, said guitar is supportable in the upright manner in a support mode, and (ii) simultaneously occupy the second and fourth positions, said first and second support legs are located adjacent to said rear surface lower portion in a stowed mode so that said first and second support legs are spaced away from the player's body when the guitar is in the playing position.

4,693,162

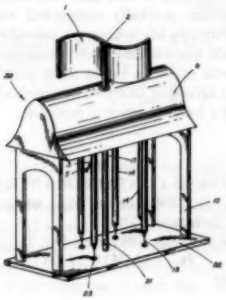
WIND-BELL

Cheng F. Lee, 25, Chang-City, Taipei, Taiwan

Filed Oct. 22, 1986, Ser. No. 921,744

Int. Cl.[4] G10D *13/08*

U.S. Cl. 84—404 **6 Claims**



1. An improved wind-bell comprising of a plurality of blades, a central rotating axle, a striking bar, a plurality of sound-producing bars, a hollow stationary post, dragging means, a frame, an annular support and base plate, characterized in that the blades are fixedly connected to the central rotating axle, said axle being rotatably connected with a ball bearing provided on the top of the frame by being inserted therethrough or otherwise rotatably connected, said axle being further inserted into the hollow stationary post to form a vertical axis, said stationary post being secured to the base plate to which said frame is fixedly connected; said annular support is fixed to the top portion of said frame, and that the center of said annular support coincides with the vertical axis of said central rotating axle and said stationary post.

4,693,163

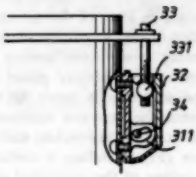
DRUM HEAD LUG ASSEMBLY

Ching L. Hsieh, No. 178, Chung Shan 2nd Road, La Chow Hsiang, Taipei Hsien, Taiwan

Filed Aug. 4, 1986, Ser. No. 893,199

Int. Cl.[4] G10D *13/02*

U.S. Cl. 84—413 **1 Claim**



1. An improved drum head lug assembly, comprising a fastener with pivot slots, a lug, a dowel, a receiver nut, and a tension rod; said improved lug assembly being further characterized in that: said pivot slot has a first and a second seat with an indentation therebetween on the top periphery of said pivot slot, said second seat is higher than said first seat, said indentation is lower than said first seat and wherein the width of said pivot slot is greater than the diameter of said dowel, said dowel connects to said lug, said dowel is slideably moveable in said pivot slot, said lug engages with said receiver nut when said tension rod is tightened, said lug is outwardly pullable so as to release said tension rod after only slightly loosening said tension rod, said lug has an inner curved portion for engaging with said receiving nut, and said receiving nut has a cylindrical exterior onto which said inner curved portion of said lug engages.

4,693,164

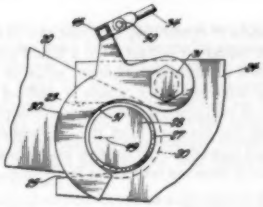
MINE ROLLER ATTACHMENT TO TANK

Israel M. Grinwald, Oakland, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 22, 1986, Ser. No. 870,063

Int. Cl.[4] F41H *11/12*

U.S. Cl. 89—1.13 **1 Claim**



1. In association with a military tank: a mine roller mechanism, and means for attaching the mine roller mechanism to the tank front end; said attaching mechanism comprising a plural number of vertical bracket walls (**24**) carried on the tank front end, each bracket wall having a leading edge formed with a horizontal notch (**23**) therein; each notch having a concave semi-circular rear surface **27**, a generally horizontal upper

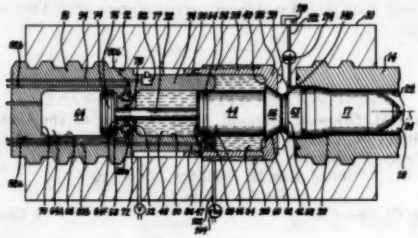
surface (29), and a generally lower horizontal lower surface (25). Said attaching mechanism further comprising a plural number of arms (20) extending rearwardly from the mine roller mechanism for individual entry into spaces between adjacent ones of the bracket walls, each arm having a pair of laterally-extending pins (28) sized to extend into a notch in a bracket wall, each pin having a circular cross section conforming to the aforementioned concave surface (27): the improvement comprising a simplified latch structure for retaining the pins in the notches; said latch structure including a plural number of hook-shaped retainer plates (30) swingably attached to the aforementioned bracket walls on a pivot axis located substantial distances above and behind the aforementioned notches; and a horizontal transverse operator bar (45) interconnecting said retainer plates for conjoint movement; said transverse bar being located above and in front of the aforementioned pivot axis; each retainer plate having a concave semi-circular undersurface (51) conforming to the front surface contour of the associated pin, whereby the retainer plates can be swung downwardly from raised positions above the notches to lowered positions wherein the concave undersurfaces prevent withdrawal of the pins out of the notches; each concave semi-circular undersurface (51) including a surface section that underlies a curved surface of the associated circular pin (28) when the retainer plates are in their lowered positions, whereby mine-explode forces cannot act through said pins (28) to lift the retainer plates from their lowered positions.

4,693,165

LIQUID PROPELLANT GUN

Inder K. Magoon, Pittsfield, and Robert E. Mayer, Williamstown, both of Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Jun. 27, 1986, Ser. No. 879,723
Int. Cl.[4] F41F *1/04*
U.S. Cl. 89—7 **2 Claims**



1. A process of controlling the mass rate of flow in an annular sheet of liquid propellant from a liquid propellant storage chamber to a combustion chamber, wherein the sheet flows through an annular orifice which is defined by the relative movement of two coaxial piston heads, comprising:

providing gas pressure from the combustion chamber to a forward face of each of the two piston heads to provide an aftwardly directed respective force on each of said piston heads;

controlling the aftward movement of one of said piston heads in response to the respective force on its forward face;

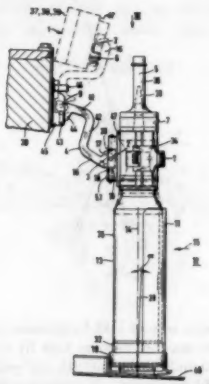
whereby the relative aftward movement of the other of said piston heads determines the cross-sectional area of said annular orifice as a function of the forwardly directed force of liquid propellant on the aft face of said other piston head and said aftwardly directed force from said combustion chamber on said forward face.

4,693,166

AMMUNITION RACK FOR VERTICALLY STANDING CARTRIDGE AMMUNITION

Manfred Pehker; Edelgard Pahlke, both of Duesseldorf, and Josef Metz, Neuss, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 22, 1985, Ser. No. 757,810
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1984, 3426761
Int. Cl.[4] F41F *9/00*; A47F *5/08*
U.S. Cl. 89—34 **7 Claims**



1. An improved ammunition rack arrangement for storing vertically standing cartridge ammunition units in the ready room of the loader on the turret platform of a tank and for removing the units therefrom; the ammunition rack having a ready room side, a stay tube for centering the cartridge base, and a clamping device for holding the ammunition unit, wherein the improvement comprises:

a stay tube having a protection shield operatively mounted thereon for protecting the side of a combustible cartridge shaft which faces the ready room, said shield being movably mounted about the longitudinal axis of the ammunition unit for removal of said unit via the ready room side;

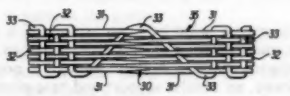
a clamping device pivotally connected via a joint to a bracket of a holding lever having a pair of opposite ends to one of its ends; said holding lever being pivotally mounted at the opposite end to a turret fixed pivot; the clamping device being arranged to move between a locked holding position and a locked removal position.

4,693,167

STRAP FOR LINKED CONTAINER ARTICLE CARRIER

Charles Bagwell, Jr., Tallahassee, Fla., assignor to Howden Coloney, Inc., Tallahasse, Fla.

Filed Mar. 25, 1985, Ser. No. 715,322
Int. Cl.[4] F42B *39/08*
U.S. Cl. 89—35.01 **10 Claims**



1. A woven strap for use in connecting a plurality of generally parallel disposed tubular carriers comprising first and second material warps which engage with one another at spaced points of intersection along their length, each of said

first and second material warps having a plurality of individual filaments which extend generally longitudinally of the strap, a series of loop means formed between said first and second material warps and between adjacent points of intersections of said first and second material warps, each of said loop means having upper and lower material layers, said first and second material warps crossing through one another at a predetermined number of said spaced points of intersection of said first and second material warps so that each of said plurality of filaments of said first and second material warps will alternately form portions of the upper and lower material layers of said loop means, each of said first and second material warps being normally firmly bound by weft material which extends back and forth generally perpendicularly with respect thereto and which are spaced apart a first closely spaced distance, said first and second material warps being loosely bound by said weft material which is spaced apart a second preselected distance greater than said first closely spaced distance adjacent to said predetermined number of spaced points of intersection of said first and second material warps so that said weft material may be extended relatively diagonally with respect to said first and second material warps whereby said first and second material warps are longitudinally moveable with respect to one another adjacent each of said predetermined number of spaced points of intersection thereof so as to permit said loop means adjacent thereto to be expanded relative to one another.

4,693,168

METHOD AND APPARATUS FOR AIMING INDIRECTLY AIMABLE WEAPONS

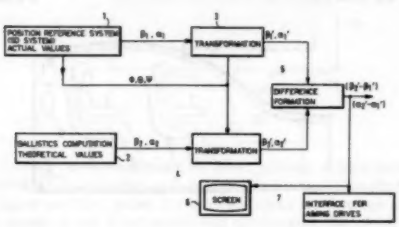
Bertold Kirst, Lilienthal; Otto Beyer, Freiburg, and Wolfgang Lipp, Denzlingen, all of Fed. Rep. of Germany, assignors to Litef GmbH, Freiburg im Breisgau, Fed. Rep. of Germany

Filed Oct. 8, 1986, Ser. No. 916,537

Claims priority, application European Pat. Off., Oct. 14, 1985, 85113032.8

Int. Cl.[4] F41G *3/10*

U.S. Cl. 89—41.11 **11 Claims**



1. A method for aiming an indirectly aimable weapon comprising the steps of:

a. specifying and storing the theoretical bearing and angle of elevation of the weapon with respect to a first coordinate system fixed in relation to the earth; and

b. determining and storing the actual bearing and angle of elevation of the weapon in said first coordinate system; and

c. determining and storing the tilting angle, tipping angle and the bearing of a second coordinate system, fixed in relation to a weapon support, with respect to the first coordinate system; then

d. continuously computing the actual and theoretical bearing and angle of elevation of said weapon with respect to said second coordinate system; then

e. continuously determining the differences between the theoretical and actual bearings and angles of elevation; and then

f. driving said weapon in accordance with said differences.

4,693,169

CONTROL DEVICE FOR RAPID FIRING PARTICULARLY AUTOMATIC WEAPONS

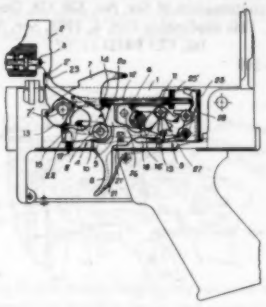
Pier G. Beretta, Gardone V.T., Italy, assignor to Fabrica D'Armi P. Beretta S.p.A., Italy

Filed Mar. 24, 1986, Ser. No. 843,074

Claims priority, application Italy, Mar. 22, 1985, 5139 A/85

Int. Cl.[4] F41D *11/10*

U.S. Cl. 89—129.02 **13 Claims**



1. A device for controlling the firing modes of a portable, automatic weapon, comprising:

(a) a breech block having a firing pin thereon and displaceable from a rear open position to a forward closed position;

(b) a tripping box with a tripping mechanism therein which includes:

(i) a spring-loaded hammer and a spring engaged with said hammer, said hammer being displaceable to a cocked position upon the opening of said breech block, and displaceable to a firing position upon urging by said spring, which spring being mounted on a spring-carrying rod that moves in accordance with the displacements of said hammer;

(ii) a trigger depressable to fire the weapon;

(iii) a safety shaft having a safety position and functioning also as a selector, said shaft having positions for said firing modes, said modes being a first individual shot fire mode, a second uncontrolled rapid fire mode, and a third controlled fire mode;

(iv) a first lever cooperating with said hammer and with said breech block when said safety shaft is in a position for said second fire mode and while said trigger is kept depressed; and

(v) a tripping pawl mounted to interact with said hammer to hold it in the cocked position during said first fire mode;

(c) a pendular, shot counter having at least one series of teeth for counting the shots fired sequentially during said third mode; said counter having a radial portion engaged with said tripping pawl for limiting the displacement of said pawl and preventing the interaction of said pawl with said hammer during said second and third fire modes;

(d) a pivoting reciprocatingly displaceable second lever for said third fire mode, actuated by said hammer through said spring-carrying rod;

(e) a controlling claw connected to said second lever, positively displaceable for engagement with said teeth of said counter and for advancement of said counter by one count following the cocking of said hammer after the firing of each controlled shot, and passively displaceable as a result of its disengagement from said hammer;

(f) a blocking counter-claw for arresting said counter during said passive displacement of said controlling claw; and

(g) a third lever for excluding said second lever from said third fire mode, said third lever engaging a first cammed

portion of said safety shaft for displacement of said second lever to a rest position when the weapon is in one of the safety position, said first fire mode and said second fire mode.

4,693,170

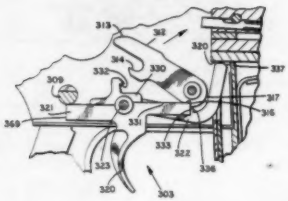
FIRING MECHANISM FOR FIREARM

Maxwell G. Atchisson, 6695 Ridgemore Dr., Doraville, Ga. 30360

Division of Ser. No. 639,526, Aug. 8, 1984, Pat. No. 4,553,469, which is a continuation of Ser. No. 336,328, Dec. 31, 1981, abandoned. This application Oct. 4, 1985, Ser. No. 784,157

Int. Cl.[4] F41D *11/02*

U.S. Cl. 89—149 **7 Claims**



1. Firearm apparatus comprising:

a hammer;

trigger mechanism means operative to hold said hammer in a cocked condition, and selectably operative to release the hammer;

bolt means normally in a forward position for firing and movable in a recoil direction, said bolt means being operative to engage and cock said hammer in response to recoil movement;

said bolt means being capable of recoil movement behind said hammer so that the bolt means in recoil momentarily overtravels the hammer, wherein the hammer if released by premature operation of said trigger mechanism means could be struck by subsequent forward movement of the bolt means;

hammer timing means operative to engage said hammer while the bolt means is in overtravel behind the hammer, and prevent the hammer from release irrespective of trigger mechanism means operation; and

said hammer timing means being responsive to said bolt means returning forwardly from recoil to a position behind said forward position, but no longer overtraveling the hammer, to disengage the hammer and return control of the hammer to said trigger mechanism means, whereby the hammer is under control of the trigger mechanism means as the bolt means returns to the forward position.

4,693,171

POSITION RESPONSIVE VALVE CONTROL FOR HYDRAULIC CYLINDER

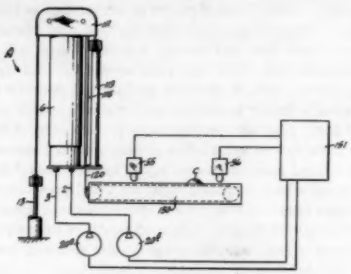
William W. Dollison, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 449,823, Dec. 14, 1982, Pat. No. 4,571,939. This application Oct. 9, 1985, Ser. No. 785,874

Int. Cl.[4] F01B *15/00*

U.S. Cl. 91—216 B **7 Claims**

1. A sensor and hydraulic control device for controlling the extend and retract stroke end limits and stroke length of a hydraulic cylinder controlled by spaced limit valves comprising: limit valves positioned to simulate the hydraulic cylinder extend and retract strokes ends locations; movable mounting means for said limit valves for changing the location of each limit valve and the distance between said limit valves for selectively adjusting the length of the strokes of said hydraulic cylinder and the end limit of the extend and retract strokes of said cylinder; cam operator means for opening and closing each of said limit valves at said ends locations; a flexible cable secured at a first end with said hydraulic cylinder and connected with said cam operator means to move said cam operator means whereby said cam operator means simulates the extend and retract strokes of said hydraulic cylinder; movable



sheave means connected with said operator means; fixed sheave means spaced from said movable sheave means; means biasing said movable sheave means away from said fixed sheave means; and said cable is reeved over said movable and fixed sheave means and secured along the second end thereof at a fixed location.

4,693,172

AUTOMATIC MIST PREVENTING SYSTEM FOR VEHICLE TRANSPARENCIES

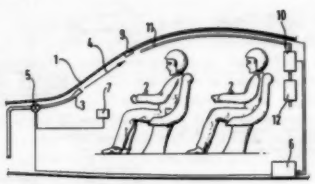
Charles P. Harvey, Brough, England, assignor to British Aerospace PLC, London, England

Filed Dec. 10, 1985, Ser. No. 807,473

Claims priority, application United Kingdom, Dec. 10, 1984, 8431084

Int. Cl.[4] B60S *1/54*

U.S. Cl. 98—2.01 **8 Claims**



1. An automatic demisting system for vehicle transparencies including:

heating means for the transparency,

control means for the heating means,

means for deriving the dewpoint temperature of the air adjacent the transparency interior surface,

means for deriving the temperature of the transparency interior surface, and computer means comprising;

means for storing a control band of transparency interior surface temperatures with upper and lower temperature levels, both levels being above said derived dewpoint temperature and related to it,

means for comparing the temperature of the transparency interior surface with the upper and lower control band temperature levels, and

means both for signalling said control means to cause said heating means to increase the temperature of the transparency when the temperature of the interior surface thereof decreases towards the lower temperature level and for signalling said control means to cause said heating means

to decrease the temperature of the transparency when the temperature of the interior surface thereof increases towards the upper temperature level whereby the temperature of said interior surface is prevented from decreasing to the dewpoint temperature by selective control of the heating means.

2. An automatic demisting system according to claim 1 wherein said heating means for the transparency comprises hot air outlet means and said control means comprises valving means.

4,693,173

CLEAN ROOM

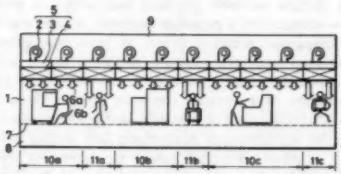
Atsushi Saiki, Koganei; Michio Suzuki, Hino; Hideo Sunami, Nishitama; Shojiro Asai, Tsukui; Michiyoshi Maki, Hachioji, and Kinichiro Asami, Niiza, all of Japan, assignors to Hitachi Plant Engineering & Construction Co., Ltd. and Hitachi, Ltd., both of Tokyo, Japan

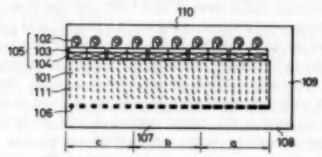
Filed Oct. 11, 1985, Ser. No. 786,550

Claims priority, application Japan, Oct. 11, 1984, 59-211376; Oct. 11, 1984, 59-211375

Int. Cl.[4] F24F *9/00*

U.S. Cl. 98—31.5 **15 Claims**





1. A clean room comprising an upper portion, a floor means provided with a plurality of openings, filter means provided in said upper portion, means for blowing clean air through said filter means to the floor means and discharging the clean air through the openings, and air return means for returning air discharged through the openings to the blowing means so as to enable blowing the clean air through said filter means to the floor means, the clean room including aisle areas where dust is generated and wafer handling areas into which dust diffuses, and wherein said means for blocking is adapted to provide an air flow rate of said clean air in the aisle which is larger than an air flow rate in the wafer handling areas whereby dust diffusion into the wafer handling areas is reduced.

4,693,174

AIR DEFLECTING MEANS FOR USE WITH AIR OUTLETS DEFINED IN DROPPED CEILING CONSTRUCTIONS

Philip K. Anderson, 72 Franklin Corner Rd., Lawrenceville, N.J. 08648

Filed May 9, 1986, Ser. No. 861,385

Int. Cl.[4] F24F *13/06*

U.S. Cl. 98—40.05 **22 Claims**

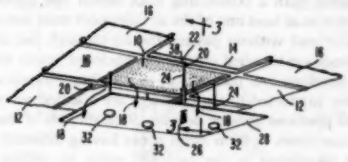
1. For use with air outlets defined in dropped ceiling constructions having a framework of inverted T-shaped support members with ceiling panels suspended therebetween, a means for deflecting air being emitted from the air outlets comprising:

(a) a plurality of suspension bracket means including:

(1) a hook means at the upper end of each of said suspension bracket means being selectively securable with respect to said inverted T-shaped support members;

(2) a rod means at the lower end of each of said suspension bracket means and extending downwardly from said hook means;

(3) a plurality of laterally extending cross-member means along said rod means positioned in spaced relation vertically with respect to one another;



(b) deflecting shield means detachably secured with respect to said suspension bracket means and extending generally horizontally therebetween and spaced downwardly from the ceiling panels and air outlets defined therein to deflect air exiting from the air outlets outwardly therefrom for dispersal thereof, said deflecting shield means defining a plurality of slot means therein adapted to receive said rod means extending therethrough; and

(c) plurality of cover cap means positioned extending over the lower portions of said rod means and the lower of said cross-member means which extend below said deflecting shield means.

4,693,175

CLEAN ROOM SYSTEM

Takayoshi Hashimoto, Kanagawa, Japan, assignor to Takasago Thermal Engineering Co., Ltd., Tokyo, Japan

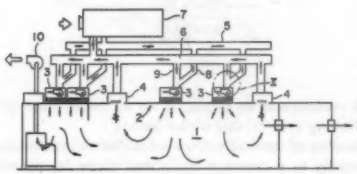
PCT No. PCT/JP85/00516, § 371 Date Apr. 30, 1986, § 102(e) Date Apr. 30, 1986, PCT Pub. No. WO86/01879, PCT Pub. Date Mar. 27, 1986

PCT Filed Sep. 17, 1985, Ser. No. 862,227

Claims priority, application Japan, Sep. 18, 1984, 59-195072

Int. Cl.[4] F24I *3/044*

U.S. Cl. 98—31.6 **8 Claims**



1. A clean room system for constructing a clean room having clean zones of different degrees of cleanliness ranging from Class 100 to Class 100,000 according to the U.S. Federal Standard 209b, by forming a ceiling in an exsiting building to form an enclosed space insulated from the ambient atmosphere by said ceiling and suitable floor and walls and installing an air treating equipment for supplying clean air into said enclosed space and withdrawing an air amount therefrom substantially corresponding to the amount of the clean air supplied thereinto, characterized in that:

said ceiling is formed by horizontally suspending ceiling bars

provided with a plurality of rectangular openings having substantially same predetermined configuration and dimension and supporting removably to the openings of the ceiling bars prefabricated ceiling elements each having a base area adapted to close each of said openings so as to close each opening by each ceiling element, said ceiling element being selected from the group consiting of a blind panel, a return air inlet port unit and a fan filter unit having a built-in fan and HEPA filter;

an air conditioner is installed outside the enclosed space,

supply air duct means for introducing air conditioned by the air conditioner into each fan filter unit and return air duct means with a connecting duct which can introduce air taken in at least one of the air inlet port units into each fan filter unit without passing the air through the air conditioner are installed outside the enclosed space; and

the positions and numbers of said ceiling elements removably supported to the openings are selected according to the positions and the degrees of cleanliness of the desired clean zones to form clean zones having different degrees of cleanliness in the enclosed space by ceiling surface exhaling and inhaling air flows.

4,693,176

AIR OUTLET FOR ROOM CONDITIONING SYSTEMS

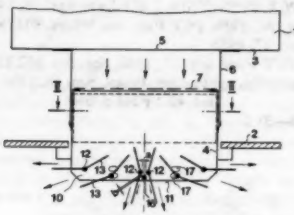
Helmut Deeg, Sulz-Attikon, and Christian Imhof, Oerlingen, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Continuation of Ser. No. 691,633, Jan. 15, 1985, abandoned. This application Mar. 13, 1986, Ser. No. 839,366

Claims priority, application Switzerland, Jan. 23, 1984, 277/84

Int. Cl.[4] F24F *13/075*

U.S. Cl. 98—40.12 **5 Claims**



1. A rectangular air outlet for an air intake duct of a room conditioning system, said outlet having

a plurality of vertically disposed deflectors extending downwardly to a common horizontal plane for distributing a flow of air;

a plurality of slats disposed below said horizontal plane in laterally inverted relationship about a central vertical plane, each said slat including a rotatably mounted spindle and a pair of vanes extending from said spindle to define an obtuse angle therebetween, at least one of said slats being rotatable to position a vane thereof in parallel to said horizontal plane for directing a stream of air horizontally outwardly; and a baffle in said central plane downstream of a passage defined between said spindles of the slats adjacent said baffle and spaced from each adjacent spindle a clear distance of less than one-half the width of said passage.

4,693,177

DEVICE FOR APPLYING SURFACE PRESSURE TO AN ADVANCING WORKPIECE

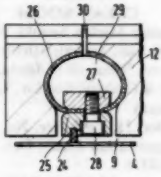
Werner Pankoke, Bielefeld, Fed. Rep. of Germany, assignor to Firma Theodor Hymmen, Bielefeld, Fed. Rep. of Germany

Filed May 7, 1985, Ser. No. 731,481

Claims priority, application Fed. Rep. of Germany, May 10, 1984, 3417289

Int. Cl.[4] B30B *5/06*

U.S. Cl. 100—154 **9 Claims**



1. In a device for applying surface pressure to an advancing workpiece, particularly wooden plates or the like, comprising at least one endless movable pressing belt which is pressed against the workpiece by a pressure medium; at least one substantially rectangular pressure plate; at least one pressure chamber admitted with the pressure medium; and a sealing supported against the pressing belt and positioned at an edge of said pressure plate, said pressure chamber being defined by a portion of a working strand of said belt, said pressure plate and said sealing; the improvement comprising said sealing being a hollow hose of elastic material, said hose extending over a peripheral edge of said pressure plate, said pressure plate being formed with a groove of the shape corresponding to that of said hose and receiving said hose such that the groove overlaps and encloses a major part of said hose and the hose is locked in said groove, said groove being open towards said pressing belt, said hose having an interior loaded with the pressure medium and a smooth contact surface so that it is pressed by said smooth contact surface immediately against the working strand of said movable belt whereby no leakage of the pressure medium occurs in the entire region of said groove, said hose including a sealing strip projecting outwardly from said groove and supported immediately against the working strand of said belt, an outer rail positioned outwardly of said hose and adjacent thereto, and an inner rail, said outer rail having a groove engaging said sealing strip.

4,693,178

PRINTING MACHINE WITH MANDREL WHEEL SKIP-PRINT VERIFICATION AND RESPONSE

Gordon D. Hudec, Westminster, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Dec. 4, 1986, Ser. No. 938,004

Int. Cl.[4] B41F *17/22*

U.S. Cl. 101—40 **14 Claims**

1. A continuous printing machine for cylindrical containers comprising:

a blanket wheel carrying printing medium on a circumferential portion thereof for printing on the cylindrical containers;

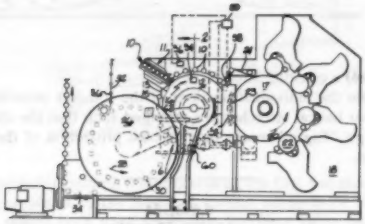
a mandrel wheel having a central axis of rotation positioned parallel to a central axis of rotation of said blanket wheel;

a plurality of mandrels operably mounted on circumferential portions of the mandrel wheel for rotatably supporting said cylindrical containers thereon;

said mandrels and said blanket being displaceable relative one another in a printing region of mandrel travel whereby a mandrel entering the printing region traverses one of two paths including a printing path and a skip-print path;

a first mandrel seating detection means positioned proximate the mandrel wheel upstream of said printing region for detecting a proper seating state of a mandrel when a container mounted thereon is in a position associated with proper printing and an improper seating state of a mandrel when no container is mounted on the mandrel and when a container mounted on the mandrel is in a position associated with improper printing and for generating a detection signal indicative thereof;

a path selection means for receiving said detection signal and for directing a sensed mandrel onto said printing path in response to a proper seating state detection by said first seating detection means and for directing a sensed mandrel onto said skip-print path in response to an improper seating state detection by said first seating detection means;



said first mandrel seating detection means and said path selection means being subject to malfunction whereby a mandrel in an improper seating state is directed along said printing path and contaminated with printing medium;

a malfunction sensing assembly for sensing a malfunction of said first mandrel seating detection means and said path selection means and generating a malfunction signal in response thereto; and

malfunction response means for receiving said malfunction signal and responding to a sensed malfunction for removing printing medium from a mandrel contaminated through a sensed malfunction and for removing cylindrical containers which are misprinted or contaminated by printing medium associated with a sensed malfunction from a normal production flow of properly printed, uncontaminated containers.

4,693,179

TEMPERATURE CONTROLLED ROTARY SCREEN PRINTING APPARATUS

John D. Watts, Woodbury, Conn., assignor to Lockwood Technical, Inc., Monterey, Calif.

Continuation-in-part of Ser. No. 679,996, Dec. 10, 1984, Pat. No. 4,627,345. This application Oct. 31, 1985, Ser. No. 793,675

Int. Cl.[4] B41L *13/06*

U.S. Cl. 101—119 **16 Claims**

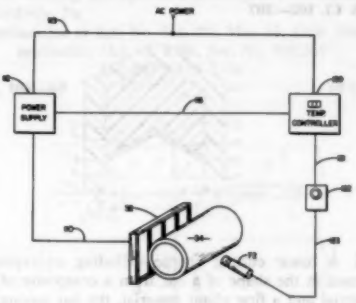
1. A temperature control system for a heated rotary screen printing apparatus for delivering heated coating liquid from the inside of a rotating thin walled print cylinder through patterned openings therein, comprising,

(a) an infrared sensor placed outside in non-contacting proximity to said print cylinder, said sensor having means for receiving radiant energy emitted from said print cylinder and means for generating a signal representative of said received radiant energy;

(b) a rapid response radiant heater placed in proximity to said print cylinder, said heater having an input terminal for receiving electrical energy and having means for generating radiant heat energy in response to said recieved electrical energy;

(c) an electrical power source having an output connected to said input terminal and having a control signal input and means for varying the electrical energy delivered to said output in response to a signal applied to said control signal input; and

(d) means for receiving said infrared sensor signal representative of received radiant energy, and means for translating said signal into a control signal, and means for applying said control signal to said electrical power source control signal input.



whereby the temperature of the coating liquid inside the cylinder is controlled by sensing the outside temperature of the printing cylinder

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4,693,180

IMPACT DETONATOR WITH A DETONATOR CAP

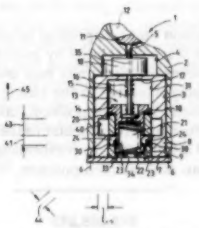
Adolf Weber, Neunkirchen; Hans Strauss, Reichenschwand, and Adolf Bankel, Uttenreuth/Weiher, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Sep. 17, 1986, Ser. No. 908,373

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1985, 3535854

Int. Cl.[4] F42C *1/02, 1/08, 9/04, 15/22*

U.S. Cl. 102—274 **7 Claims**

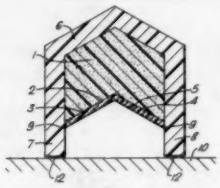


1. Impact or percussion detonator including a detonator cap; a striker actuatable by a spring force for piercing said detonator cap from the rear end of said detonator; a mechanical delay arrangement including blocking members which, in the blocking position of said members are located, on the one side, in recesses formed in said striker and, on the other side, in recesses formed in a detonator component, said detonator component being constituted of an axially-movable securing sleeve; and a base member secured to a housing of said detonator having a cutout for receiving said blocking members at a distance towards the detonating direction.

4,693,181
LINEAR CUTTING CHARGE

David A. Dadley, Sevenoaks, and Peter J. Haskins, Kemsing, both of England, assignors to Royal Ordnance plc, London, England

Filed Oct. 17, 1983, Ser. No. 548,672
Int. Cl.[4] F42B 1/00
U.S. Cl. 102—307 15 Claims

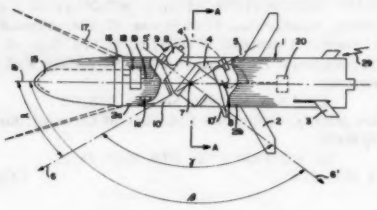


1. A linear cutting charge including an explosive mass formed in the shape of a bar from a composite of explosive material and a first pliant material, the bar having a groove extending longitudinally along one of its faces, within which groove is located a liner formed from a composite of particulate metal and a second pliant material.

4,693,182
AMMUNITION UNIT

Nils Winblad, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Jul. 17, 1985, Ser. No. 755,862
Claims priority, application Sweden, Jul. 17, 1984, 8403738
Int. Cl.[4] F42B 15/26
U.S. Cl. 102—476 9 Claims



1. An ammunition unit comprising: an elongated casing and a shaped charge warhead ignited by means of a direct impact on a target by means of a proximity fuze and an external signal, said warhead being movable in the casing from a first, initial position into a second inclined position, said movement occurring about a tilting axis perpendicular to the longitudinal axis of said casing, and a tilting means performing said movement of said warhead into said inclined position.

4,693,183
TRACK SYSTEM FOR A PASSENGER-ACCOMMODATING VEHICLE AS PART OF A ROLLERCOASTER

Georg Pötzsch, Westendstrasse 121, D-8000, München 2, Fed. Rep. of Germany

Filed Dec. 12, 1985, Ser. No. 808,123
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3446951
Int. Cl.[4] A63G 21/10
U.S. Cl. 104—55 14 Claims

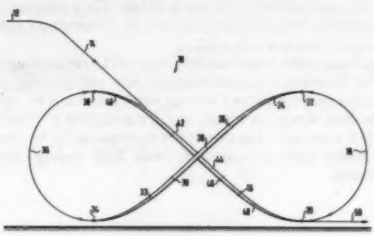
1. In a track system for a passenger-accomodating vehicle as a part of a rollercoaster comprising:

tracks which form

(a1) an acceleration stretch,

(a2) a rollover stretch consisting of several portions, in which the vehicle is rotated 180° around its lateral axis,

(a3) two helical stretches in which the vehicle is rotated 180° around its longitudinal axis, and



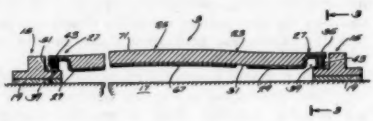
(a4) a coasting stretch,

wherein the individual portions of the rollover stretches and the two helical stretches are arranged such that the shape of the digit "Eight" results in a vertical projection of the track system.

4,693,184
SAFETY FLOOR

Robert J. Peterman, Hartland, Wis., assignor to Spacesaver Corporation, Fort Atkinson, Wis.

Filed Mar. 17, 1986, Ser. No. 839,966
Int. Cl.[4] A47B 53/00
U.S. Cl. 104—295 5 Claims



1. A safety module for sensing the presence of a force applied thereto comprising:

a. a generally flat rectangular panel;

b. a leaf spring attached to each corner of the panel for resiliently supporting the panel above a support surface and for deflecting toward the support surface under the influence of the force, each leaf spring having a first free end secured to the panel and a second free end in support contact with the support surface and having a hole therethrough; and

c. a rigid elongated retainer associated with each spring, each retainer being secured to the panel and slidingly passing through the hole in the spring second free end for slidingly guiding the second free end for contacting the support surface as the panel deflects relative to the support surface.

4,693,185
CONTROL SYSTEMS FOR VEHICLE FLUID SUSPENSION SYSTEMS

Trevor A. Easton, Grimsby, and John A. Gaiser, Beamsville, both of Canada, assignors to Dofasco Inc., Hamilton, Canada

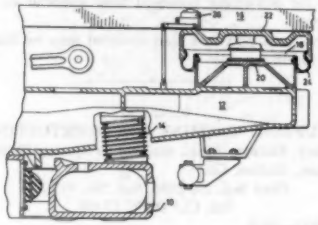
Filed Feb. 21, 1986, Ser. No. 831,678
Int. Cl.[4] B61F 5/36
U.S. Cl. 105—199.2 11 Claims

1. A control system for vehicle support systems for a vehicle of the kind comprising a vehicle body mounted by four spaced supports on two separate longitudinally-spaced vehicle trucks, with two supports on each truck, the two supports on each

truck being disposed on opposite sides of the longitudinal centre line of the vehicle; the system comprising:

levelling valve means for a first, second and third of the supports, each adapted to supply fluid to and discharge fluid from its respective first, second and third support so as to maintain the support with a predetermined height between the respective portions of the truck and the vehicle body,

fluid flow control means for the fourth support not having a levelling valve for supplying fluid to the said fourth support and for discharging fluid therefrom,



pressure detecting means detecting the first and second fluid pressures in the first and second supports of the truck which both have respective levelling valve means and detecting the difference between the said first and second pressures, and detecting the third and fourth pressures in the third and fourth supports and detecting the difference between the said third and fourth pressures, and

means controlling the said fluid flow control means for the fourth support to adjust the fluid pressure in the fourth support until the difference between the said third and fourth pressures is equal to the difference between the said first and second pressures.

4,693,186

FUNICULAR RAILWAY CAR HAVING COMPARTMENT SUSPENDED ABOVE CHASSIS

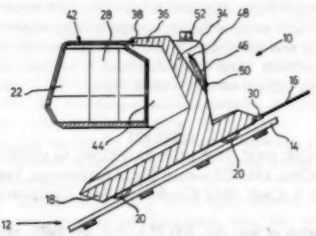
Alphonse Lisa, Grenoble, France, assignor to Pomagalski, Fontaine, France

Filed Sep. 3, 1986, Ser. No. 903,228

Claims priority, application France, Sep. 9, 1985, 85 13449

Int. Cl.[4] B61B *9/00*

U.S. Cl. 105—329.1 **10 Claims**



1. A car, notably of a funicular railway, having a chassis running above a track laid along a slope having a gradient, and a compartment disposed on said chassis, said compartment having a longitudinal symmetry plane parallel to a longitudinal axis of the track, as well as a floor and a roof, said chassis comprising a hanger arm having a free end and a central articulation spindle supported by said free end to which said compartment is suspended, said central articulation spindle extending perpendicularly to said longitudinal plane to allow free movement of the compartment in said longitudinal plane and to hold the floor in a horizontal position independently from the gradient being climbed by the car.

4,693,187

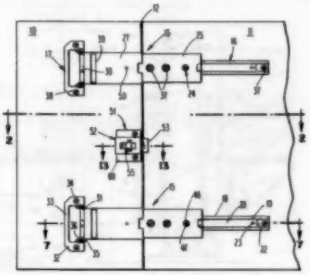
LATCH AND HINGE ASSEMBLY

Robert H. Bisbing, Springfield, Pa., assignor to Southco, Inc., Concordville, Pa.

Continuation of Ser. No. 864,280, May 19, 1986. This application Oct. 10, 1986, Ser. No. 918,589

Int. Cl.[4] A47B *1/04*

U.S. Cl. 108—69 **19 Claims**



1. A hinge and latch assembly for use in mounting an extension leaf to a support, said assembly comprising in combination:

(a) at least one telescopic hinge mechanism connected at one end to an underside surface of said support and connected at the other end to an underside surface of said extension leaf and having a plurality of members between said end connections in sliding telescopic relation to one another, wherein said other end connected to said extension leaf includes pivot means for the pivoting of said extension leaf, wherein said extension leaf is slidable from a first position adjacent and substantially parallel to the underside surface of said support and is then pivotable substantially 180° to a second position substantially coplanar to said support whereby said support and said extension leaf form a substantially continuous planar surface, and wherein said pivot means comprises means for retaining said extension leaf in said first position when said plurality of members are in the fully retracted condition; and

(b) at least one latch mechanism mounted to the underside surface of said extension leaf for retaining said extension leaf in said second position, wherein said latch mechanism is in an unlatched condition when said extension leaf is in said first position, and wherein said latch mechanism is automatically actuated between latched and unlatched conditions in response to the sliding movement of said extension leaf.

4,693,188

ROTATABLE SHELF INSERT FOR CORNER CUPBOARDS

Guenter Twellmann, Spenge-Lenzinghausen, Fed. Rep. of Germany, assignor to Ninkaplast GmbH, Bad Salzuflen, Fed. Rep. of Germany

Filed Sep. 30, 1985, Ser. No. 781,666

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1985, 8506281

Int. Cl.[4] A47B *11/00*

U.S. Cl. 108—139 **9 Claims**

1. A rotatable shelf insert for corner cupboards, comprising:

a substantially circular shelf having a top and a bottom;

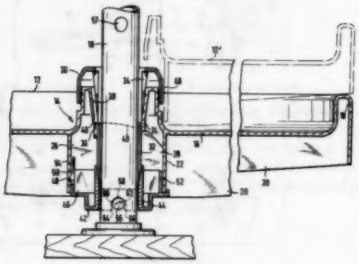
a hub centrally disposed in and secured to the shelf and

having a central aperture circumscribed by a first inner wall;

a guide rod for supporting the shelf, and passing through the hub, wherein a radial space is defined between the guide rod and the first inner wall;

means for rotatably mounting said guide rod;

means, including a cylindrical clamping sleeve inserted in the radial space and having a lower end conically tapered from wide to narrow to form a truncated conical shape at said lower end, for radially clamping, via radial force applied at said lower end, the hub and secured shelf to the guide rod for rotation with the guide rod; and



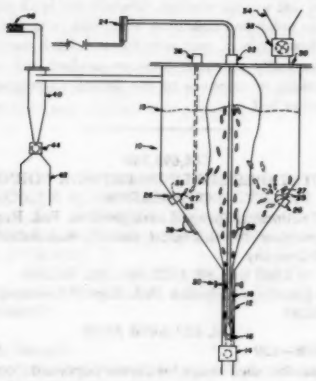
a supporting sleeve comprising a cylindrical sleeve having an inner wall surrounding said guide rod, said cylindrical sleeve having an upper end at which said inner wall conically widens to form a tapered gap between said inner wall and said guide rod, and a supporting member connected to said cylindrical sleeve for supporting the shelf, wherein the cylindrical sleeve of the supporting sleeve extends into said radial space from the bottom of said shelf, wherein the clamping sleeve extends into the radial space from the top of said shelf, and wherein the conically tapered end of said clamping sleeve engages the conically widening inner wall of the supporting sleeve.

4,693,189

FLUIDIZED BED FEEDER

Richard M. Powers, P.O. Box 476, Clifton, Ariz. 85533

Filed Nov. 3, 1986, Ser. No. 926,177
Int. Cl.[4] F23D *1/00*
U.S. Cl. 110—347 **35 Claims**



1. A fluidizing bed feeder comprising:

a first hopper having a conical lower portion and a lid element;

a bottom tubular element operatively coupled to a lower most portion of said conical portion;

means for delivering fluidizing gas to said tubular element comprising an elongated fluidizing tube coupled to said lid element, extending through said first hoppper, and having a distal end disposed within said bottom tubular element so as to terminate in a lower portion of said bottom tubular element, said distal end defining a plurality of gas delivering apertures for delivering gas to material in said lower portion of said bottom tubular element; and

means for delivering powered feed material to said first hopper

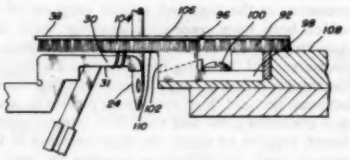
whereby, said powered feed material may be fluidized by said fluidizing gas.

4,693,190

TUFTING MACHINE FOR OVERTUFTING

Ian Slattery, Hixson, Tenn., assignor to Spencer Wright Industries, Inc., Dalton, Ga.

Filed Sep. 29, 1986, Ser. No. 912,316
Int. Cl.[4] D05C *15/08*
U.S. Cl. 112—80.3 **9 Claims**



1. In a tufting machine including means for feeding a pile fabric including a backing material having primary yarn tufts extending therefrom, said primary tuft having a first pile height, and a plurality of stitch forming instrumentalities for forming secondary yarn tufts selectively in said backing to provide an overtuft pile fabric, a needle plate having a support surface over which said pile fabric is fed toward said instrumentalities, said needle plate including a plurality of fingers pojecting therefrom for supporting said pile fabric at the locations of said instrumentalities, each of said fingers comprising a mounting portion fastened to said needle plate, a neck extending from and upstanding from said mounting portion and a finger portion extending from the upper end of said neck in a direction oppositely disposed relative to said mounting portion, said finger portion having an upstanding supporting edge over which said pile fabric is fed from said needle plate, said upper supporting edge being disposed at an elevation above said support surface of said needle plate.

4,693,191

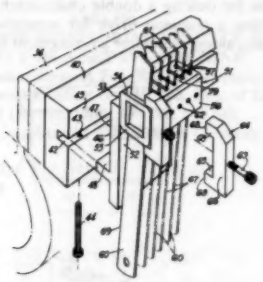
KNIFE HOLDER FOR TUFTING MACHINE

Joseph L. Card, 1515 Edgewood Cir., Chattanooga, Tenn. 37405, and Roy T. Card, 4012 Creekwood Ter., Chattanooga, Tenn. 37421

Continuation of Ser. No. 508,853, Jun. 29, 1983, abandoned. This application Dec. 15, 1986, Ser. No. 941,718
Int. Cl.[4] D05C *15/10*
U.S. Cl. 112—80.6 **9 Claims**

1. A tufting machine of the type having needles for inserting yarns through a backing material and wherein loopers catch and hold the loops of yarns as they are inserted through backing material by the needles, and a knife assembly supporting means is reciprocated for moving knives for cutting action with respect to the loops caught by the loopers; wherein the improvement comprises: a knife assembly between said knives and said knife assembly supporting means, said knife assembly

including a knife bar carried by said supporting means, said knife bar having a sidewise opening recess, knife holder means carried by said knife bar, said knife holder means having tongue means protruding into said recess, said tongue means having increments spaced from each other and received at spaced locations in said recess for preventing relative rotational movement of said knife holder means in such recess, said



knife holder means being moveable into and out of engagement with said supporting means, and detent means for locking said tongue means in place, said knife holder means having a plurality of equally spaced parallel slots each being disposed at an angle to the plane of said loopers and at an angle to the horizontal, whereby said knife holder holds said knives with their cutting edges against and cooperating with said loopers.

4,693,192

CONTROL DEVICE FOR SEWING MACHINE

Hideo Yasui, Tokyo, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

PCT No. PCT/JP85/00047, § 371 Date Oct. 25, 1985, § 102(e) Date Oct. 25, 1985, PCT Pub. No. WO85/03957, PCT Pub. Date Sep. 12, 1985

PCT Filed Feb. 5, 1985, Ser. No. 799,376

Claims priority, application Japan, Feb. 29, 1984, 53-39317

Int. Cl.[4] D05B *19/00*

U.S. Cl. 112—121.11 **5 Claims**

1. A control device for a sewing machine comprising:

input means capable of individually inputting a variety of information as program date including a first category of program relative information consisting of respective commands for at least formation, execution, combination and termination of a program, a second category of unit sewing pattern relative information consisting of respective commands for lock of needle arm, fabric feed, and thread cut, and a third category of numerical information consisting of a program management number and the number of stitches in relation to a sewing pattern forming program for forming a sewing pattern integrally composed of unit sewing patterns;

discriminator means for discriminating between commands for program formation and commands for program execution from said input means;

memory means for storing input data entered after said command for program formation into the memory as respective allotted program management numbers;

read-out means for reading a program management number out of said memory means in response to said command for program execution;

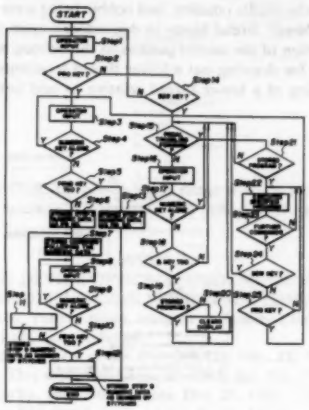
detector means for detecting the number of stitches and the lock position of said needle arm from the rotational phase of a top shaft driven by a sewing machine drive motor each time said top shaft rotates;

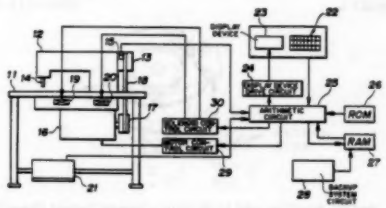
comparison means for comparing the output of said detector means with data concerning the number of stitches in said read-out program data;

output control means for ON/OFF controlling a reverse solenoid of a fabric feed mechanism and a thread cut solenoid of an arm of the sewing machine in accordance with the results obtained from said comparison;

control means for lock of the needle arm at a predetermined position in accordance with the command for lock of the needle arm in the program data;

means for sequentially designating stored management numbers;





means for sequentially storing a designated management number; and

means for reading-out and executing program data corresponding to the designated management number based on a stitching instruction in accordance with the designated sequence, whereby the stitches are sequentially performed by a combination of different program data.

4,693,193

DEVICE OF GUIDING DRAWING-OUT OF A LOWER THREAD FROM A HORIZONTAL BOBBIN CARRIER OF A SEWING MACHINE

Susumu Hanyu; Kazumasa Hara, both of Tokyo; Akiyoshi Sasano, Musashino, and Mikio Koike, Oume, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,751

Claims priority, application Japan, Oct. 5, 1984, 59-208300

Int. Cl.[4] D05B *3/02, 19/00, 57/26*

U.S. Cl. 112—121.11 **8 Claims**

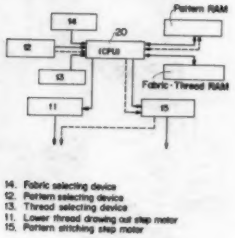
1. A lower thread drawing out device for a computerized sewing machine that includes a needle which is laterally swingable relative to a fabric feeding direction so as to have one needle position at any one time, the needle being formed to carry an upper thread and being vertically reciprocable relative to a fabric to be sewn for penetrating the fabric to be sewn and to concatenate the upper thread with a lower thread to thereby produce lock stitches in a fabric, the lower thread device comprising:

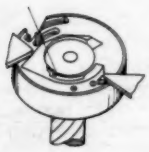
a cup-shaped loop taker with a surrounding wall with a portion formed as an edge in a beak shape for catching thread, said loop taker being rotatable in a timed relation

with a vertical reciprocation of the needle to catch the upper thread to concatenate with the lower thread to thereby form lock stitches;

a bobbin positioned in said loop taker so as to form as space between said surrounding wall of said loop taker and said bobbin, said bobbin being formed to be wound thereabout by a lower thread, said loop taker being formed so that the lower thread is extendable between said bobbin and the needle position, said bobbin being arranged so that the lower thread biases in dependence upon the relative position of the needle positon to the bobbin; and

means for drawing-out a lower thread to compensate for a biasing of a lower thread relative to said bobbin by the





needle position and including a lower thread drawing out element having a free end, said element extending radially and outwardly from said loop taker and terminating at said free end, said free end being arranged in said space between said surrounding wall of said loop taker and said bobbin and being arranged to contact a lower thread between said bobbin and the needle position when the lower thread is extended therebetween, said element and therefore said free end being rotatably movable relative to said loop taker to compensate for said biasing of the lower thread relative to said bobbin by the needle position so that the lower thread is movable in association with said free end.

4,693,194

MECHANISM FOR ACTUATING THE HOOK AND CLAW AND FOR STITCH SETTING IN PORTABLE SEWING MACHINE

Riccardo Buzzi, Milan, Italy, assignor to Matalplast S.r.l., Italy

Filed Mar. 3, 1986, Ser. No. 835,267

Claims priority, application Italy, Mar. 14, 1985, 19904 A/85

Int. Cl.[4] D05B *1/06, 27/22*

U.S. Cl. 112—199 **9 Claims**

1. In a machine for sewing a double chain stitch in a material, an arrangement comprising:

(a) a sewing needle elongated and reciprocatable along a longitudinal axis, said needle having a needle eye;

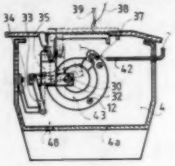
(b) means for feeding a first thread through the needle eye;

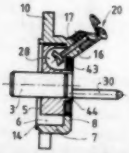
(c) a movable feed dog for feeding the material to be sewn underneath the needle;

(d) a single turnable hook member having a stem elongated along a hook axis which is inclined relative to the longitudinal axis, and an arcuate hook extending circumferentially at least partly about the longitudinal axis and having a hook eye, said hook member being mounted for turning movement in alternate circumferential directions about the inclined hook axis;

(e) means for feeding a second thread through the hook eye; and

(f) means for making a double chain stitch in the material, including a common drive for repetitively moving the feed dog along successive advancement strokes to succes-





sively advance the material to be sewn past the reciprocatable needle and the hook member, and for simultaneously and repetitively turning the hook member along said alternate circumferential directions to intertwine the first and second threads into the double chain stitch.

4,693,195

SEWING SEAM, PARTICULARLY FOR JEAN FABRIC

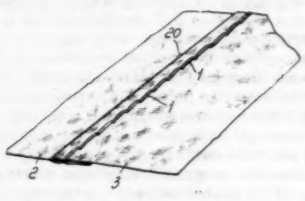
Elio Fiorucci, Milan, Italy, assignor to Fiorucci S.p.A., San Donato Milanese, Italy

Filed Jun. 3, 1986, Ser. No. 871,020

Claims priority, application Italy, Mar. 6, 1986, 21145/86[U]

Int. Cl.[4] D05B *97/00;* **B32B** *7/08;* **A41D** *27/24*

U.S. Cl. 112—262.1 **4 Claims**



1. A sewing seam particularly for jean fabric having in combination therewith at least one fabric flap having an edge, an edge portion and an overlapped portion and at least one other fabric flap having an other edge and an other edge portion, said sewing seam comprising at least one hemming seam, at least one fold, at least one basting line, and stitches including a plurality of perforations, and at least one cord-like element, said hemming seam being substantially rigidly associated with said edge of said one fabric flap and with said other edge of said other fabric flap, said basting line being substantially rigidly associated with said one fabric flap and said other fabric flap and extending substantially parallel to said hemming seam, between said hemming seam and said basting line there being defined a doubled flap edge portion, said doubled flap edge portion comprising said edge portion of said one fabric flap and said other edge portion of said other fabric flap, said at least one fold being formed substantially at said basting line and causing said doubled flap edge portion to overlie said at least

one fabric flap at said overlapped portion thereof, said perforations being formed in said doubled flap edge portion and said overlapped portion of said at least one fabric flap, said cord-like element successively extending through said perforations and thus defining said stitches, said stitches being adapted for joining together said doubled flap edge portion and said overlapped portion of said at least one fabric flap.

4,693,196

APPARATUS FOR MONITORING SHUTTLE THREAD SUPPLY OF A SEWING MACHINE

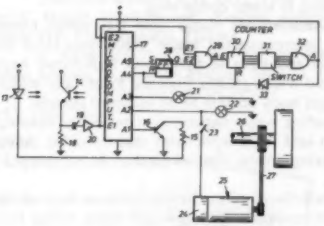
Walter Hager, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Dec. 18, 1985, Ser. No. 810,648

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3446682

Int. Cl.[4] D05B *45/00, 69/18*

U.S. Cl. 112—273 **5 Claims**



1. An apparatus for monitoring a shuttle thread supply in a sewing machine with a lockstitch revolving shuttle, comprising a light-emitting diode which sends a beam of light through openings in a bobbin housing and in a bobbin of the shuttle, a photodetector for receiving light from the bobbin housing when a supply of thread on the bobbin falls to a selected amount and which thereby triggers a switching pulse for actuating means, counting means connected to the photodetector for counting to a number corresponding to the selected amount of thread on the bobbin, said counting means counting toward the number each time light is received by the photodetector, the photodetector acting as a pulse generator for said counting means, and additional actuating means connected to and controllable by the counting means when the number has been reached by said counting means.

4,693,197

SEWING MACHINE APPARATUS WITH IMPROVED SHAFT SPEED MEASURING AND INDICATING MEANS

Kazuya Tami, Chofu, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Filed May 29, 1986, Ser. No. 868,794

Int. Cl.[4] D05B *69/18*

U.S. Cl. 112—277 **1 Claim**

1. A sewing machine apparatus, comprising:

(a) storage means for storing a preset RPM range of the sewing machine;

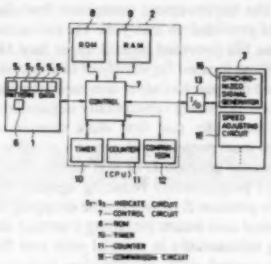
(b) means for detecting signals synchronized with rotation of the main shaft of the sewing machine;

(c) means for determining the cycle of time of the sewing machine by referring to said synchronized signals;

(d) means for comparing said cycle time with said preset RPM range;

(e) indicator means for indicating the RPM of the sewing machine as being within said preset RPM range determined by comparing said cycle time with said preset RPM range; and

(f) indicator means for indicating the direction of adjustment of the sewing machine RPM to bring the sewing machine



RPM within said preset RPM range if the RPM of the sewing machine is not within said preset RPM range.

4,693,198

ADJUSTING DEVICE OF SLACK AMOUNT OF LOWER THREAD IN ZIGZAG SEWING MACHINE

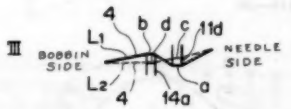
Susumu Hanyu, Tokyo, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan

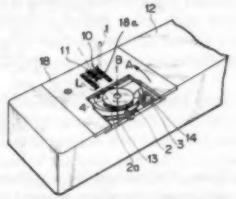
Continuation-in-part of Ser. No. 560,422, Dec. 12, 1983, abandoned. This application Sep. 19, 1985, Ser. No. 777,954

Claims priority, application Japan, Dec. 27, 1982, 57-226790

Int. Cl.[4] D05B *3/02, 27/00, 49/00, 57/26*

U.S. Cl. 112—443 **2 Claims**





1. An improved zigzag sewing machine which is provided with a needle plate having a laterally elongated needle dropping hole formed therein into which a needle with an upper thread vertically reciprocates as it laterally swings traversing the maximum range between a right end needle position and a left end needle position of the needle dropping hole **18***a*, a horizontal rotary loop taker having a central rotation axis located forwardly of the needle and rotated to catch an upper thread loop formed at the needle, a bobbin carrier having an upper face **14***b* and disposed horizontally in the loop taker and restrained against rotation, a bobbin loaded with the lower thread and disposed in said bobbin carrier, said lower thread being supplied to said needle dropping hole by way of a guide located leftwardly of the left end needle position, and a feed dog structure including a yoke extending substantially in parallel with the laterally elongated needle dropping hole and located forwardly of the needle dropping hole, the feed dog structure being operated to move vertically and horizontally to

transport a sewn fabric relative to the needle while the yoke **11***c* engages the bobbin thread to draw out the same from the bobbin as the feed dog structure is vertically moved down, wherein the improvement comprises first slack control cam means **11***d* provided on said yoke **11***c* and second slack control cam means **14***a* provided on said upper face **14***b* of said bobbin carrier **14** and located forwardly of said first slack control cam means, said first slack control cam means including a first slack control cam extending substantially in parallel with said needle dropping hole **18***a*, said first slack control cam including a portion (a) most projecting down at a position opposite to said left end needle position L of said needle dropping hole and a portion (c) progressively reducing upward toward said right end needle position R of said needle dropping hole, said second slack control cam means including a second slack control cam extending substantially in parallel with said first slack control cam, said second slack control cam including a portion (b) most projecting up at a position opposite to said left needle position L of said needle dropping hole and a portion (d) progressively reducing down toward said right end needle position R of said needle dropping hole, said first and second slack cams **11***d*, **14***a* cooperating with each other to control the slack of said bobbin thread **4** with respect to the left and right end needle positions of said needle dropping hole during the zigzag stitching operation of the sewing machine.

4,693,199

RELEASE MEANS FOR SAILBOARD FOOTSTRAPS

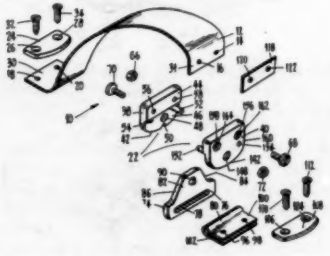
Ludwig Omachen, 6 Bells Boulevard, Jan Juc, 3228, Victoria, and Stephen Janson, 38 Sheepwash Road, Barwon Heads, 3227, Victoria, both of Australia

Filed Dec. 2, 1985, Ser. No. 804,342

Claims priority, application Australia, Nov. 30, 1984, PG8383

Int. Cl.[4] B63H *9/04*

U.S. Cl. 114—39 **15 Claims**



15. A release arrangement for a sailboard footstrap, including male and female members adapted to be connected to a footstrap portion or the sailboard; said female member including two generally parallel flexible portions defining a space; said male member being generally planar and adapted for insertion into said space in said female member; said members being provided with engagement means which normally retain said members in engagement after said insertion, said engagement means comprising a generally frusto-conical boss on each major face of said male member and a mating recess in the inner face of each portion of said female member; said male and female member being permitted limited relative rotational movement about the axis of said engaged bosses and recesses, said male member having lateral surfaces capable of co-operating with lateral surfaces of said female member extending between said portions when the limit of said limited rotational movement is reached under the influence of a rotational force exceeding a predetermined value to lever said bosses from said recesses by flexing said portions, thereby disengaging said members.

4,693,200

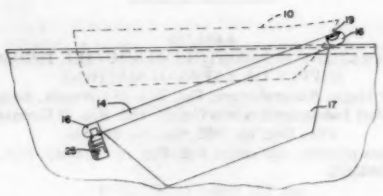
APPARATUS FOR ENCLOSING A BOAT HULL

Thomas D. Noble, Chapin, Ill., assignor to Noble Boyd Enterpises, Beardstown, Ill.

Filed Nov. 27, 1985, Ser. No. 802,429

Int. Cl.[4] B63B *59/02*

U.S. Cl. 114—47 **11 Claims**



1. A selectively semi-submergible apparatus for enclosing the submerged body portion of a boat hull while the body remains floating in water comprising:

(1) a semi-submergible planar rigid framework formed of sealably interconnected water impervious rigid tubular bow, side and stern sections, said framework having a length and width greater than the length and width of a submerged body portion to be enclosed therein,

(2) a depending water impervious continuous envelope secured to said framework with said envelope defining a space having greater dimensions than the submerged body portion,

(3) said tubular bow section having between the ends thereof floatation material which prevents water filling the interior of said bow section and maintains said bow section buoyant while said framework remains in the water,

(4) said tubular side sections and stern section having the interior thereof in fluid flow communication,

(5) pump means in fluid flow communication with the interior of said tubular side sections and stern section,

(6) said pump means being adapted for pumping water into the interior of said tubular side and stern sections to effect pivotally moving said side and stern sections relative to said bow sections as a unit downwardly to completely submerge said stern section below the surface of said water to a depth greater than the draft of said submerged body portion while said bow section remains buoyant on the surface of the water whereby the submerged body portion can be freely moved across the submerged stern section and within the perimeter of said framework, and

(7) said pump means being further adapted to remove water from the interior of said side sections and stern section to effect floating siad side and stern sections and enclosing the submerged body portion within said framework and envelope.

4,693,201

LOW DRAG SURFACE CONSTRUCTION

John E. F. Williams, and Jack Lang, both of Cambridge, England, assignors to Rolls-Royce plc, London, England

Filed Sep. 12, 1985, Ser. No. 796,945

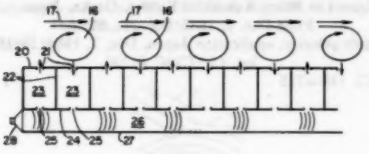
Claims priority, application United Kingdom, Sep. 13, 1984, 8423140

Int. Cl.[4] B61D *35/00*

U.S. Cl. 114—67 R **5 Claims**

1. A surface construction subject to drag caused by a fluid stream thereacross having a plurality of linear vortices extending parallel with, and adjacent thereto, said surface construction comprising: vortex stabilizing means for producing a regularly spaced variation in boudnary flow streamwise of said surface construction to thereby stabilize the plurality of linear vortices in parallel spaced apart relationship to each other transverse of the boundary flow streamwise of the surface construction, said vortex stabilizing means including a plural-

ity of apertures in said surface construction, energizing means coupled to said apertures to cause fluid to ingress and egress in a predetermined sequence with respect to neighboring aper-



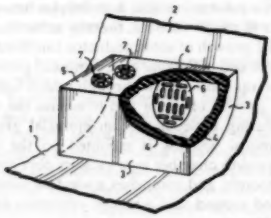
tures, and said variation in boundary flow causing said linear vortices to roll streamwise, at approximately half of freestream speed to thereby minimize drag.

4,693,202

FREEZE RESISTANT BOTTOM WELL

Pentti K. Helpiö, Uusikaupunki, Finland, assignor to Rauma-Repola OY, Uusikaupunki, Finland

Filed Oct. 21, 1985, Ser. No. 789,488
Claims priority, application Finland, May 13, 1985, 851880
Int. Cl.[4] B63B *25/08*
U.S. Cl. 114—74 A **5 Claims**



1. A bottom well of a vessel, comprising:
at least one of a bottom and a broad side of a vessel;
a wall and cover-plate structure attached to the at least one of the bottom and broad side for together defining a bottom well having an inner space within inside surfaces thereof;
a water inlet in one of the at least one of the bottom and broad side for communication of the inner space with outside water;
a water outlet in one of the wall and cover-plate structure for communication of the inner space with systems of the vessel; and
means comprising at least one resilient body in the inner space for compensating for volume changes of water in the bottom well caused by the water freezing in the bottom well.

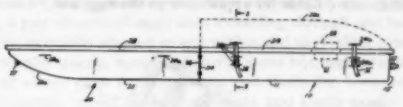
4,693,203

SEGMENTED BOAT

Marvin C. Lewis, P.O. Box 225, Murrels Inlet, S.C. 29576

Filed Jan. 22, 1985, Ser. No. 693590
Int. Cl.[4] B63B *7/02*
U.S. Cl. 114—353 **12 Claims**

1. A segmented boat comprising a pair of opentopped shells; each said shell having a pair of sides and a pair of ends, each of said sides and one of said ends including an outwardly extending flange terminating in an upstanding flange; each of said shells having a rim therearound along its uppermost edge, each said rim being comprised of a terminal edge of each said upstanding flange along said sides and said one of said ends and a terminal edge of the remaining end, said upstanding flange and rim of one shell being capable of being disposed outwardly of and telescopically overlapping with the upstanding flange and rim of the other said shell when placed together with one shell



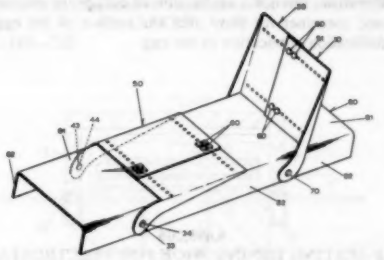
inverted relative the other shell for forming an enclosed box, and means for releasably connecting said shells together in said enclosed condition.

4,693,204

SIDE FACING BACKREST FOR BOATS

Robert A. Klein, 6610 N. Yuba St., Milwaukee, Wis. 53223

Filed Oct. 23, 1986, Ser. No. 922,485
Int. Cl.[4] B63B *25/00*
U.S. Cl. 114—363 **7 Claims**



1. A two-section backrest comprising:
a right backrest section;
a left backrest section;
said right and left backrest sections being mirror images of each other;
each backrest section having a substantially rectangular back panel, said back panels having a top edge, bottom edge, and free edge, each backrest section having a side panel connected to said back panel by a substantially right angle bend;
said side panels each having an extended portion which extends below the bottom of the back panel of its backrest section, said extended portion also extending substantially out from the plane of the back part of its section;
said back panels having openings which line up with each other when said back panels are over-lapped, allowing the two backrest sections to be fastened to each other by known fastening means inserted through said openings;
said extended portions of said side panels being capable of being fastened to a seat located between them when said back portions are attached together.

4,693,205

EGG DECORATING KIT

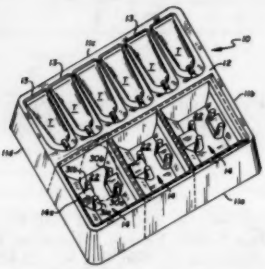
Gerald D. Thill, Eden Prairie, Minn., assignor to Spearhead Industries, Inc., Minneapolis, Minn.

Filed Mar. 3, 1986, Ser. No. 835,180
Int. Cl.[4] B05C *13/02*; B05D *5/06*
U.S. Cl. 118—13 **7 Claims**

1. An egg decorating kit, including:
a. a base;
b. upwardly directed support means arranged on said base with the uppermost end thereof arranged and constructed

to support an egg thereon to hold the egg in elevated position above said base;

c. a collapsible fluid container for releasably containing decorative fluids for application to the egg; and,



d. a quantity of decorative fluid in said container releasable therefrom upon the application of collapsing pressure to said container for flow over the surface of the egg for decoration application to the egg.

4,693,206

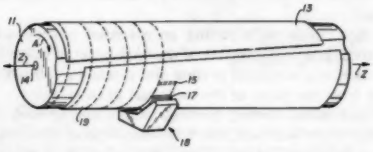
SELF-SEATING TONING SHOE FOR ELECTROSTATIC DRUM PRINTERS

Gene F. Day, Cupertino, Calif., assignor to Precision Image Corporation, Redwood City, Calif.

Continuation-in-part of Ser. No. 796,872, Nov. 12, 1985, Pat. No. 4,655,165, which is a continuation-in-part of Ser. No. 763,040, Aug. 6, 1985. This application May 9, 1986, Ser. No. 861,521

Int. Cl.[4] B05B *5/02*

U.S. Cl. 118—631 **23 Claims**



1. A toning shoe assembly for an electrostatic drum printer comprising,

a drum having a round outer circumferential surface capable of supporting a sheet carrying an electrostatic latent image,

a toning shoe having a toning surface matching a region of the circumferential surface of the drum, with a raised outer periphery in contact with said sheet and a depressed central region in communication with a supply of fluid developer for applying the developer to the sheet, and

means for positionally biasing said shoe against said sheet at a single point thereof, said shoe being movable relative to a normal orientation about first, second and third mutually orthogonal axes through said single point of said shoe so as to be responsive to the local orientation of said sheet on said drum.

4,693,207

APPARATUS FOR THE GROWTH OF SEMICONDUCTOR CRYSTALS

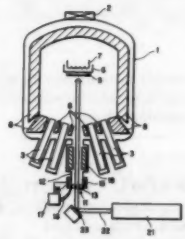
Toshiro Hayakawa, Nara; Takahiro Suyama; Kohsei Takahashi, both of Tenri, and Saburo Yamamoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 6, 1985, Ser. No. 805,517

Claims priority, application Japan, Dec. 7, 1984, 59-259570

Int. Cl.[4] C23C *16/00*

U.S. Cl. 118—715 **1 Claim**



1. An apparatus for the growth of semiconductor crystals in which the surface of a substrate is irradiated with molecular beam containing elements by which semiconductor thin films are formed on the substrate within a molecular beam epitaxial growth chamber in a high vacuum, thereby achieving molecular beam epitaxial growth of semiconductor thin films onto the substrate, wherein said molecular beam epitaxial growth chamber comprises an optical window through which light is introduced into said growth chamber and irradiates the surface of said substrate during molecular beam epitaxial growth, and wherein said optical window is mounted on the molecular beam epitaxial growth chamber by a vacuum port containing a cooling means therein, and comprises a window substance and a heater disposed around said window substance for heating said window substance.

4,693,208

FEEDER OF OXYGEN GAS CONTAINING STEAM

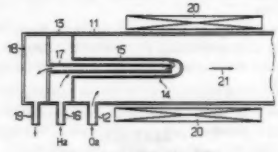
Takamasa Sakai, Kusatsu, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto

Filed Jul. 15, 1986, Ser. No. 885,697

Claims priority, application Japan, Jul. 15, 1985, 60-156708

Int. Cl.[4] C23C *8/16*

U.S. Cl. 118—724 **7 Claims**



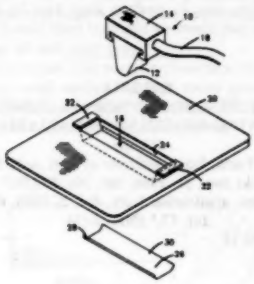
1. A feeder of oxygen gas containing steam in which hydrogen gas is fed into an atmosphere of oxygen gas, and oxygen gas containing steam generated by combustion of the hydrogen gas is fed to a treating object, characterized by comprising a combustion chamber, an oxygen gas induction tube which induces the oxygen gas to the combustion chamber, a hydrogen gas chamber separated from said combustion chamber by a hydrogen osmotic film of oxidation catalysis therebetween, a hydrogen gas induction chamber which induces the hydrogen gas to the hydrogen gas chamber, an exhaust tube communicated with said hydrogen gas chamber, and heating means.

4,693,209

APPARATUS FOR DISPENSING SOLDER PASTE

John L. Leicht, Hawthorn Woods, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 687,886, Dec. 31, 1984, Pat. No. 4,636,406.
This application Jul. 17, 1986, Ser. No. 886,462
Int. Cl.[4] B05C 5/02
U.S. Cl. 118—213 21 Claims



1. An apparatus for dispensing solder paste onto a surface in a predetermined pattern, said apparatus comprising:

solder paste dispensing means adapted to be coupled to a solder paste supply, said dispensing means having a dispensing opening therein for extruding the solder paste therethrough;

stencil means having a predetermined pattern and raised sides and ends;

means for applying said dispensing means to said stencil pattern and moving said dispensing means across said stenciled pattern while extruding said solder paste from said dispensing means onto said stenciled pattern with said raised sides and ends on said stencil means containing the movement of said dispensing means and thereby selectively controlling the application of said solder paste; and

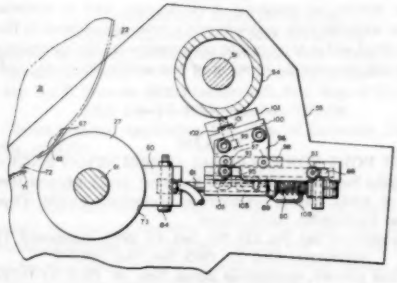
means for removing said dispensing means and said stenciled pattern from said surface forming said predetermined solder paste pattern on said surface.

4,693,210

QUICK CHANGE FOUNTAIN

Frank J. DiFrank, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 28, 1986, Ser. No. 856,323
Int. Cl.[4] B05C 1/02
U.S. Cl. 118—259 7 Claims



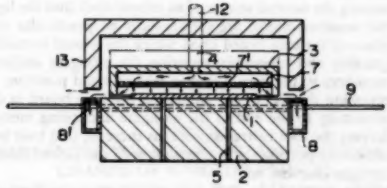
1. A quick change fountain for the application of a solvent to the surface of a vertical gravure roll, comprising a vertical member extending parallel to but horizontally displaced from the axis of said gravure roll, mounting means extending from said vertical member and including a pair of vertically spaced, outwardly extending, horizontal base holders, a generally rectangular clamp plate having a vertical length approximately equal to the vertical spacing between said base holders, a pair of shoulder bolts extending out from the ends of said clamp plate, a pair of vertical angle slots extending through said base holders, said bolts adapted to seat within said angle slots, a pair of vertically spaced, horizontal shafts, linear bearings mounted on said clamp plate for supporting said shafts for horizontal reciprocation, spring means for biasing said shafts axially in one direction, a vertical fountain adapted to engage the surface of a roll, means for mounting said fountain to ends of said horizontal shafts to bias the fountain into engagement with the roll, and means connecting said clamp plate to said mounting means.

4,693,211

SURFACE TREATMENT APPARATUS

Nobutoshi Ogami, and Masaru Kitagawa, both of Shiga, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Dec. 18, 1985, Ser. No. 810,425
Claims priority, application Japan, Jan. 10, 1985, 60-950[U]
Int. Cl.[4] C23C 16/00
U.S. Cl. 118—725 11 Claims



1. In an apparatus for processing a wafer substrate with an adhesion-enhancing agent, said apparatus including a heating or cooling plate having an upper surface for heating or cooling said substrate thereon, conveyer means for conveying said substrate to and from said plate, introducing means for introducing said adhesion-enhancing agent onto said substrate and an insulating housing provided above said plate, the improvement therein comprising:

an inner cover means provided with said housing for defining a processing chamber between said heating or cooling plate and said cover means, said cover means being connected to said introducing means and movable relative to said heating or cooling plate when a substrate is conveyed to and from said heating or cooling plate;

a straightening plate having a plurality of holes over the whole surface thereof and being mounted within said cover means between said introducing means and said plate;

spacer means for defining a space between the upper surface of said heating or cooling plate and the lower peripheral edge of said cover means; and

an exhausting chamber provided entirely around said lower peripheral edge of said housing, said chamber having a port which extends entirely around said peripheral edge of said housing, said chamber being connectable to suction means,

said adhesion-enhancing agent introduced into the processing chamber through said straightening plate and supplied onto the substrate evenly and uniformly through said holes flows out through said space between said heating or cooling plate and said cover means as a natural flow, and is then drawn through said port into said exhausting chamber by said suction means.

4,693,212

ANIMAL RESTRAINT APPARATUS AND METHOD

Kenneth R. Black, P.O. Box 2073, Universal City, Tex. 78148

Filed Feb. 3, 1986, Ser. No. 825,346

Int. Cl.[4] A61D *3/00*

U.S. Cl. 119—103 **15 Claims**

10. A method of physically restraining the feet of an animal while the animal is in an upright, standing position for grooming or other needs comprising the steps of:

adjusting a plurality of elongate anchoring members slideably and rotatably mounted upon a horizontally disposed base board and each having means at one end for restraining each foot of an animal to a selected position approximating the normal stance of an animal such that the legs of the standing animal are substantially perpendicular to the plane of the base board upon which the animal is standing;

adjustably and releasably securing the elongate anchoring members to the base board in said selected position;

positioning the feet of the animal on the base board in close proximity to the end of the elongate anchoring members having the foot restraining means thereon, said base board means supporting the entire weight of the animal standing upright thereon; and

securing each of the foot restraining means around each respective ankle portion of the lower leg of the animal.

4,693,213

WASTE HEAT RECOVERY BOILER

Eiji Yanai, and Tetsuzo Kuribayashi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

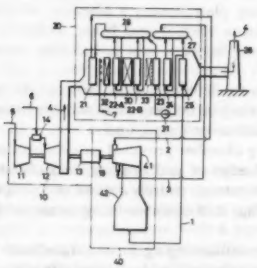
PCT No. PCT/JP85/00466, § 371 Date Mar. 19, 1986, § 102(e) Date Mar. 19, 1986, PCT Pub. No. WO86/01579, PCT Pub. Date Mar. 13, 1986

PCT Filed Aug. 23, 1985, Ser. No. 841,179

Claims priority, application Japan, Aug. 24, 1984, 59-175030

Int. Cl.[4] F22D *1/00*

U.S. Cl. 122—7 R **8 Claims**



1. A waste heat recovery boiler of the type which utilizes an exhaust gas of a gas turbine and generates steam for driving a steam turbine, the improvement wherein at least two denitrating devices for removing NOx components in the exhaust gas therefrom are disposed inside said waste heat recovery boiler, said waste heat recovery boiler is equipped with fuel economizers for preheating feed water by said exhaust gas, rear and front evaporators for evaporting the pre-heated feed water, a superheater for for heating the vaporized feed water and generating the driving steam for said steam turbine, all of said constituent members being disposed sequentially from a downstream side to an upstream side of the exhaust gas, and wherein said denitrating devices are disposed between said at least two evaporators and between said front evaporator and said superheater.

4,693,214

TAPPET SYSTEM FOR INTERNAL COMBUSTION ENGINES HAVING SHAFTS WITH VARIABLE-PROFILE CAMS

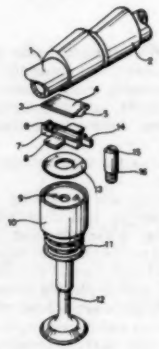
Andrea Titolo, Turin, Italy, assignor to Fiat Auto S.p.A., Turin

Filed Jun. 24, 1986, Ser. No. 877,937

Claims priority, application Italy, Jul. 2, 1985, 67604 A/85

Int. Cl.[4] F01L *1/34*

U.S. Cl. 123—90.18 **3 Claims**



1. Tappet system for engines having a head and a camshaft with variable-profile cams, of the type comprising a shoe, a shoe-carrying saddle, and a cup slidable in the head, and in which the shoe has a flat, rectangular cam-shoe contact surface and is provided on its surface opposite the contact surface with a semi-circular-sectioned projection whose axis is perpendicular to a longitudinal axis of the camshaft, wherein the shoe-carrying saddle has a seat in its upper surface for coupling with the projection, two tabs disposed on diametrally opposite faces of the saddle for centering it in the cup, and an extension coaxial with the seat, and wherein a retaining element is fixed in the head and is arranged to cooperate with the extension of the saddle to prevent rotation of the saddle about the valve axis.

4,693,215

INLET PORT FOR INTERNAL COMBUSTION ENGINE

Katsuhiko Sugiyama; Hiromitsu Kawazoe, and Yoshinori Idota, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Continuation of Ser. No. 531,391, Sep. 12, 1983, abandoned. This application Oct. 21, 1985, Ser. No. 789,370

Claims priority, application Japan, Sep. 18, 1982, 57-162934; Mar. 30, 1983, 58-56113

Int. Cl.[4] F01L *3/00*

U.S. Cl. 123—188 M **10 Claims**

1. An internal combustion engine comprising:

a cylinder chamber having an end face and a wall surface;

means defining an off-center inlet hole in said end face; and

an inlet port for directing inlet air into said cylinder chamber, said inlet port comprising:

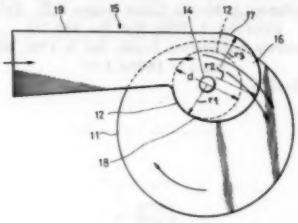
a swirl generating section being connected to said inlet hole; and

a straight, elongated introducing section connected to said swirl generating section, wherein:

said swirl generating section surrounds said valve stem;

said swirl generating section comprises a wall surface having an outside part proximate and substantially parallel to the portion of said wall surface of said cylinder chamber closest to said inlet hole and an inside part coinciding with the edge of said inlet hole;

the width between said peripheral surface of said valve stem and said wall surface of said swirl generating section gradually decreases from said outside part up to said inside part and is constant at said inside part;



the height of said wall surface of said swirl generating section decreases gradually from said outside part to said inside part at an average rate of not less than 0% and not more than 0.18% of the diameter of said inlet hole per 1 degree around said valve stem; and

said elongated introducing section is connected to said outside part smoothly so that the main stream of the inlet air flows from said elongated introducing section into a position between said wall surface of said outside part and the peripheral surface of said valve stem and further flows through said inlet hole into said cylinder chamber along the tangential direction of said wall surface of said cylinder chamber closest to said inlet hole without being turned spirally around said valve stem, whereby the main stream of the inlet air flows along said wall surface of said cylinder chamber to produce swirl.

4,693,216

CRANKSHAFT BEARINGS FOR INTERNAL-COMBUSTION ENGINES

Herbert Ampferer, Bietigheim-Bissingen, and Klaus Gröger, Hemmingen, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 17, 1985, Ser. No. 755,795

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1984, 3426208

Int. Cl.⁴ F02F *7/00*

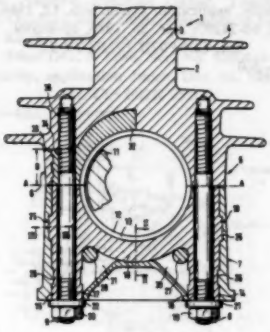
U.S. Cl. 123—195 R **15 Claims**

1. Crankshaft bearings that consist of a light metal alloy formed by bearing sections and bearing caps, each of said bearing caps being held by screw means to a respective one of said bearing sections and each said bearing cap having a core means of ferrous metallic material, wherein:

said core means having at least two lugs extending between opposite faces of said bearing cap and being separated from one another with a transverse part means extending between and connected to said lugs forming a bearing support section of said crankshaft bearings,

reinforcing means being connected between said lugs for reinforcing said core means,

said lugs receiving said screw means, and wherein



said screw means extend into a bottom of each of said bearing sections for holding each of said bearing caps against the bottom of the respective one of said bearing sections.

4,693,217

ARRANGEMENT FOR MOUNTING AN ENGINE ON THE CHASSIS OF A MOTOR VEHICLE

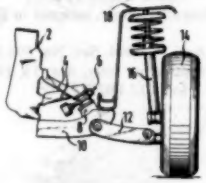
Wilhelm Beer, Russelsheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 12, 1985, Ser. No. 764,410

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1984, 3431324

Int. Cl.⁴ F16M *13/00*

U.S. Cl. 123—195 A **8 Claims**



1. Arrangement for mounting an engine or an engine-transmission drive unit on a chassis of a motor vehicle, including a damping assembly interposed between engine load bearing support means and comprised of a metal-rubber component and a vibration attenuating means comprising a lever arm securely connected at one end to elastomeric members, said lever arm having a mass secured to an opposite free end, the improvement comprising:

the lever arm extending between said elastomeric members such that a longitudinal axis of said lever arm projects outwardly from a load bearing axis, said load bearing axis being formed along said load bearing support means,

the lever arm having said one end secured to a bent portion of a rigid outer member that is part of the rubber-metal component and operatively connected to the engine.

4,693,218

INTERNAL COMBUSTION ENGINE

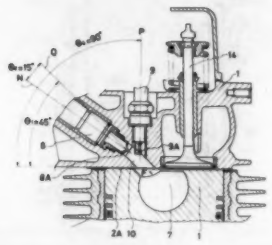
Katsuhiko Nagakura, Yawata, Japan, assignor to Yanmar Diesel Engine Co., Ltd., Osaka, Japan

Filed Sep. 6, 1985, Ser. No. 773,269

Claims priority, application Japan, Sep. 12, 1984, 59-189810; Apr. 10, 1985, 60-74297; Apr. 26, 1985, 60-88899

Int. Cl.[4] F02B *19/10, 19/12*

U.S. Cl. 123—260 **5 Claims**



1. An internal combustion engine having a main combustion chamber in a top portion of a piston, and an ignition chamber in a cylinder head, which is provided with a fuel injection valve and an ignition plug, characterized in that the direction in which fuel is ejected from said fuel injection valve is in accordance with the forward direction of a swirl in said main combustion chamber, the axis of the ejected fuel being spaced from a substantially central portion of said main combustion chamber by a distance of not more than $\frac{1}{4}$ of the radius thereof, a recess which is in communication with said main combustion chamber being provided in the section of the top portion of said piston which is on an extension of said ignition chamber, the diameter of said ignition chamber is set larger than that of an atomized fuel spray at the outlet thereof, a spark gap of said ignition plug being provided in a position which is spaced by 4 to 10 mm from the center of the spherical end of a nozzle of said fuel injection valve toward the outlet of said ignition chamber, and 2 to 7 mm from the axis of said fuel injection valve in the radial direction of said ignition chamber.

4,693,219

INTERNAL COMBUSTION ENGINE WITH DIRECT FUEL INJECTION

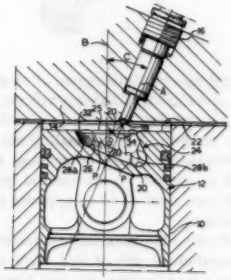
Antonio Burgio, Moncalieri, Italy, assignor to Fiat Auto S.P.A., Turin, Italy

Filed Apr. 11, 1984, Ser. No. 598,943

Claims priority, application Italy, Apr. 11, 1983, 67393 A/83

Int. Cl.[3] F02B *23/06*

U.S. Cl. 123—276 **5 Claims**



1. An internal combustion engine, particularly a diesel engine with direct fuel injection, including at least one cylinder having a combustion chamber, a piston moveable within the cylinder and having a crown, a cavity formed in the piston crown and constituting at least part of the combustion chamber of the cylinder, and a fuel injector having a nozzle provided with a plurality of spraying holes facing the cavity in the piston, the fuel injector having an axis oriented at an angle substantially between 15° and 30° to the axis of the cylinder and the cavity in the crown of the piston having an inclined flat substantially elliptical base wall which is oriented perpendicular to the axis of the injector with the center of said base wall being located on an extension of the axis of the injector when the piston is substantially in its top dead center position and a mouth which is centered on the axis of the cylinder.

4,693,220

IDLING SPEED CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Hiroshi Hasebe, Hatogaya; Masahiko Asakura, Tokorozawa; Michio Sakaino, Fujimi, and Yukio Miyashita, Hannou, all of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Jul. 1, 1986, Ser. No. 880,788

Claims priority, application Japan, Jul. 5, 1985, 60-146610

Int. Cl.[4] F02M *3/07*

U.S. Cl. 123—339 **3 Claims**

1. An idling speed control system for controlling idling rotational speed of an internal combustion engine having an intake passage and a throttle valve arranged therein, comprising:

vacuum-operated actuator means having a vacuum chamber, and a diaphragm defining said vacuum chamber chamber, and a diaphragm defining said vacuum chamber and operatively connected to said throttle valve for controlling opening and closing thereof in response to pressure in said vacuum chamber;

change-over control valve means operatively connected to said vacuum-operated actuator means for supplying said vacuum chamber, selectively, with a first control pressure or opening said throttle valve and a second control pressure for closing said throttle valve;

electronic control means operatively connected to said engine and said change-over control valve means, said electronic control means being adapted to effect control of the idling rotational speed of the engine by generating an on-off control pulse signal having a period corresponding to rotational speed of said engine, one of on-period and off-period of said on-off control pulse signal having a predetermined constant value, supplying said change-over control valve means with said on-off control pulse signal, in response to which said change-over control valve means supplies said vacuum chamber of said vacuum-operated actuator means, selectively, with said first control pressure and said second control pressure, said electronic control means being adapted to determine the rotational speed of said engine and a rate of decrease in the rotational speed of said engine, and halt said control for a

predetermined period of time when the determined rotational speed of said engine falls within a predetermined range and at the same time the determined rate of decrease in the engine rotational speed falls within a predetermined range;

valve opening-correcting means operatively connected to said throttle valve and being responsive to at least one predetermined external load applied on said engine for correcting to a larger opening the opening of said throttle valve which is determined by said change-over control valve means in response to said on-off control pulse signal; and

said electronic control means being adapted to actuate said valve opening-correcting means to increase the opening of said throttle valve which is determined by said change-over control valve means in response to said on-off control pulse signal, when said electronic control unit halts said control of the idling rotational speed of said engine for said predetermined period of time.

4,693,221

ENGINE CONTROL SYSTEM

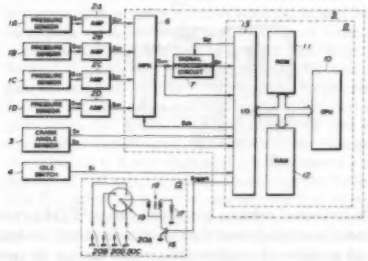
Yuji Nakajima, Yokosuka, and Akito Yamamoto, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 31, 1986, Ser. No. 891,168

Claims priority, application Japan, Sep. 5, 1985, 60-194877

Int. Cl.[4] F02P *5/15, 11/00*

U.S. Cl. 123—425 **7 Claims**



1. In an internal combustion engine wherein a spark timing control device adjusts spark timing in accordance with detected value of vibration in combustion pressure, an engine control system comprising;

(a) means for detecting vibration in combustion pressure within the engine;

(b) means for converting the detected combustion pressure vibration into a correlation value relating to combustion condition of the engine;

(c) means for determining whether or not a malfunction of the spark timing control device occurs by comparing the current correlation value to a reference value corresponding to the correlation value which was obtained during engine idling; and

(d) means for controlling the spark timing in accordance with the detected combustion pressure vibration and also with the determination as to whether or not a malfunction of the spark timing control device occurs.

4,693,222

INTAKE AIR CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE

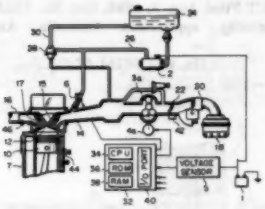
Hiroshi Itou, Nagoya; Yukihiro Okane, Toyota, and Akio Kuramoto, Okazaki, all of Japan, assignors to Toyota Jidosha Kaboshiki Kaisha, Aichi, Japan

Filed Dec. 5, 1986, Ser. No. 938,463

Claims priority, application Japan, Dec. 18, 1985, 60-282741

Int. Cl.[4] F02B *15/00*

U.S. Cl. 123—432 **6 Claims**



1. An intake air control device for an internal combustion engine having a battery, an electrically operated fuel pump connected to said battery, fuel injector means supplied with fuel from said fuel pump, an intake air passage communicating with the engine cylinder, an intake air flow control means arranged in said intake air passage and operative in response to the running condition of the engine, an operating means for operating said air flow control means, a detecting means for detecting the voltage of said battery, and a control means for controlling said operating means so as to operate said intake air flow control means such that the amount of the intake air is decreased when the detected voltage is lower than a predetermined value.

4,693,223

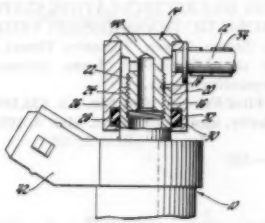
FUEL INJECTION VALVE CONNECTION

Edgar S. Eshleman, Holcomb; Martin J. Field, Churchville, and James L. Penwright, Gasport, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 21, 1984, Ser. No. 622,953

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—468 **1 Claim**



1. A fuel injection valve connection comprising a fuel injection valve having a cylindrical inlet fitting, said fitting having a threaded internal surface and a cylindrical external surface, a fuel connector having a projection with a threaded external surface that mates with the threaded internal surface of said fitting, said connector also having a sleeve with a cylindrical internal surface surrounding said fitting and an O-ring sealingly engaging said internal surface of said sleeve and said external surface of said fitting, whereby said valve may be rotated relative to said connector without breaking the sealing engagement between said valve and said connector, and wherein said

connector also has a tab engageable with said injector to prevent unthreading of said valve from said connector.

4,693,224

FUEL INJECTION METHOD AND APPARATUS

Michael L. McKay, Willeton, Australia, assignor to Orbital Engine Company Proprietary Limited, Balcatta, Australia

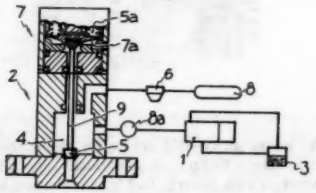
PCT No. PCT/AU84/00150, § 371 Date Apr. 2, 1985, § 102(e) Date Apr. 2, 1985, PCT Pub. No. WO85/00854, PCT Pub. Date Feb. 28, 1985

PCT Filed Aug. 3, 1984, Ser. No. 740,067

Claims priority, application Australia, Aug. 5, 1983, PG0718/83

Int. Cl.[4] F02M *67/02*

U.S. Cl. 123—531 23 Claims



1. A method of injecting fuel into a spark ignited internal combustion engine comprising:

controlling the supply of a gas to a fuel holding chamber to maintain a reference pressure that is above atmospheric pressure;

delivering fuel to the holding chamber against said reference pressure and regulating the period of and pressure differential effecting the delivery of the fuel to control the quantity of fuel delivered in accordance with the engine fuel demand;

establishing communication between the holding chamber and the engine after the delivery of the fuel to the holding chamber; and

maintaining said supply of gas to the holding chamber while said communication exists so the pressure of the gas is sufficient to displace the fuel from the holding chamber into the engine.

4,693,225

EXHAUST GAS RECIRCULATION SYSTEM FOR AUTOMATIC TRANSMISSION VEHICLE

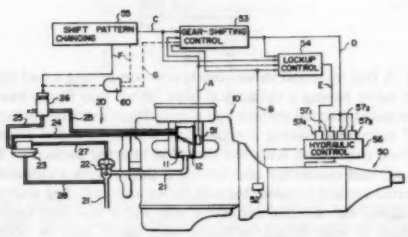
Yoshio Abe; Tetsuo Okano; Tomohiro Omori, and Minoru Kawamoto, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Feb. 28, 1986, Ser. No. 835,109

Claims priority, application Japan, Mar. 6, 1985, 60-45096

Int. Cl.[4] F02M *25/06*

U.S. Cl. 123—568 15 Claims



1. An exhaust gas recirculation system for an internal combustion engine, comprising an automatic transmission which has a plurality of gear ratios and shifts between said gear ratios in accordance with a selected one of a plurality of shift patterns including an economy pattern in which upshift between successive ones of said plurality of gear ratios occurs at first corresponding predetermined vehicle speeds and a power pattern in which upshift between further successive ones of said plurality of gear ratios occurs at second corresponding predetermined vehicle speeds, wherein said second corresponding predetermined vehicle speeds are respectively greater than said first corresponding predetermined vehicle speeds, one of the shift patterns being selected by operation of a shift pattern changing means, and an exhaust gas recirculation control means which reduces the amount of exhaust gas to be returned to the combustion chamber for substantially all said vehicle speeds and loads in response to the selection of said economy pattern.

4,693,226

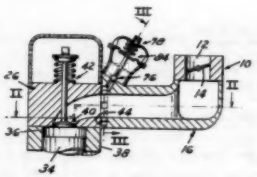
EGR CONTROL SYSTEM

Michael A. Choma, Dearborn Hts., Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 2, 1986, Ser. No. 869,481

Int. Cl.[4] F02M *25/06*

U.S. Cl. 123—568 11 Claims



1. A self-contained exhaust gas recirculation (EGR) system for insertion as a unit between the cylinder head and the intake manifold of an internal combustion engine having an intake manifold formed with a plurality of laterally spaced individually runners connected individually from a throttle body to separate intake ports in the face of the engine cylinder head for the supply of an air/gas flow therethrough separately to each intake port, comprising an elongated spacer between the ends of the runners and the face of the cylinder head, the spacer having formed therein a plurality of laterally spaced individual air/gas flow passages each aligned with (each) one of the runners and (the) an engine intake port(s), the spacer having an EGR passage connected (at one end) to a source of exhaust gases, a plurality of EGR gas distribution passages formed within the spacer connected at one end in common to the EGR passage and at their other end communicating individually with (to) each of the spacer air/gas flow passages for the flow of exhaust gases thereinto and therefrom individually to the engine intake ports, and an EGR valve reciprocably mounted in the EGR passage on the spacer for controlling the flow of EGR gases to each intake port in approximately equal volumes.

4,693,227

MULTI-FUEL INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

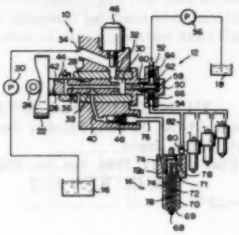
Yasuo Satou, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed May 7, 1986, Ser. No. 860,584

Claims priority, application Japan, May 21, 1985, 60-106833; Aug. 22, 1985, 60-182992; Oct. 9, 1985, 60-223791; Oct. 12, 1985, 60-155259[U]; Oct. 12, 1985, 60-155261[U]; Oct. 12, 1985, 60-155264[U]

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—575 22 Claims



1. A multi-fuel injection system for an internal combustion engine having a plurality of cylinders, said system comprising:

a first fuel injection pump means having a plurality of fuel outlets for delivering a first fuel in a predetermined cycle under a pressure higher than a predetermined value;

a second fuel injection pump means having a single fuel outlet and adapted to be driven synchronously with the first fuel injection pump means for delivering a second fuel under a pressure lower than said predetermined value;

a plurality of fuel injection nozzles arranged one by one for each cylinder of the engine, each of said fuel injection nozzles comprising a body having a cavity therein, at least one fuel injection port for injecting the fuel from said cavity to the relevant cylinder, a valve seat about said fuel injection port, a valve member inserted in said body so as to engage with said valve seat to open or close said fuel injection port, a first and a second fuel inlet passages formed through said body for introducing said first and said second fuels into said cavity, respectively, and means for causing said valve member to open said fuel injection port when the pressure of the introduced fuel is higher than said predetermined value and to close said port when the pressure is lower than said predetermined value;

a first set of fuel pipes for interconnecting the outlets of the first fuel injection pump means and the first inlet passages of the fuel injection nozzles one by one, respectively;

a second set of fuel pipes each having one end thereof commonly connected to said single outlet of said second fuel injection pump means and the other end connected to the second fuel inlet passages of the fuel injection nozzles one by one; and

means for preventing a backflow of the second fuel from each of said second inlet passages to said single outlet of said second fuel injection pump means.

4,693,228

CROSSBOW TRIGGER MECHANISM

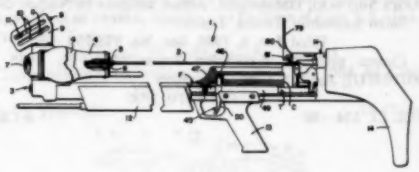
Gary Simonds, Gainesville, Fla.; Thomas P. Jennings, Sun Valley, Calif., and Henry Gallops, Melrose, Fla., assignors to Kidde Recreation Products, Inc., Gainsville, Fla.

Filed Feb. 13, 1986, Ser. No. 829,348

Int. Cl.[4] F41C *19/00*

U.S. Cl. 124—25 5 Claims

2. A crossbow having a frame provided with a bowstring attached to resilient limbs, a trigger mechanism for holding the bowstring in a drawn position and allowing the selective release thereof, characterized in that; said trigger mechanism including a trigger assembly attached to said frame rearwardly of said limbs and having forwardly opening bowstring guide means therein adapted to receive a drawn bowstring, a pivotal bowstring catch member provided with a shoulder normally disposed in a position within the path of said guide means, catch spring means urging said catch shoulder into said normally disposed position, a pivotal sear having means normally precluding forward displacement of said catch member shoulder within said guide means while allowing of free rearward displacement of said shoulder against the force of said catch



spring means as said bowstring is rearwardly drawn into said guide means and rearwardly past said shoulder, a trigger operable to pivot said sear means and allow forward displacement of said catch member shoulder along with the forward release of said drawn bowstring from said guide means, wherein said trigger assembly includes a housing having a lower body and an attached upper arm, and said guide means comprises a horizontal slot through said housing between said lower body and upper arm, and wherein said housing comprises two laterally adjacent sections, and said catch member and sear are carried by one said section.

4,693,229

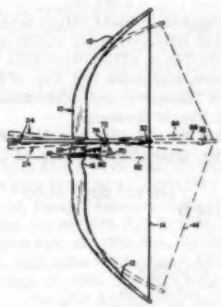
PROJECTILE SHOOTING GUIDE FOR BOWS

Jim Z. Nishioka, 268 Hemlock NW., Salem, Oreg. 97304

Filed Mar. 6, 1986, Ser. No. 836,698

Int. Cl.[4] F41D *10/00*; F41B *5/00, 15/00*; A63B *65/02*

U.S. Cl. 124—41 A 14 Claims



9. For use with a bow of the type having a bowstring and tensioning means connected to the bowstring, a projectile shooting guide comprising

a support for supporting a projectile guide member, said support being mounted for use on a bow,

an elongated guide member for support on a bow by said support,

said guide member including forward and rearward portions and in an operative position said rearward portion extends rearwardly from said support,

projectile guiding means in said guide member for guiding a projectile to be shot by a bowstring, and

said support including means to allow vertical movement of

said guide member during drawing and shooting movements of said guide member,

said guide member also including a shooting position substantially perpendicular to a longitudinal axis of a bow,

said shooting guide also including resilient means for urging said guide member to maintain said shooting position during drawing and shooting movements of said shooting guide.

4,693,230

ARCHERY BOW HANDLE RISER

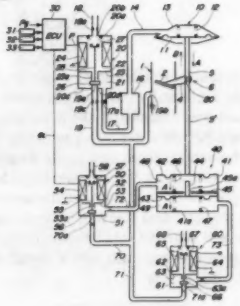
Akira Sugouchi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Jan. 6, 1986, Ser. No. 816,194

Claims priority, application Japan, Jan. 11, 1985, 60-001958[U]; Jan. 11, 1985, 60-002929

Int. Cl.⁴ F41B *5/00*

U.S. Cl. 124—88 **3 Claims**



1. An improved archery bow having a grip, comprising:

a handle riser including an FRP shell and a core encased by said FRP shell; and

an elongated connector extending through said core in the longitudinal direction of said handle riser for a length of said grip and secured at both ends to said FRP shell.

4,693,231

GEARLIKE, ABRASIVE PRECISION WORKING TOOL, A METHOD FOR DRESSING OF SUCH A TOOL AND A DRESSING TOOL FOR DRESSING THE TOOL

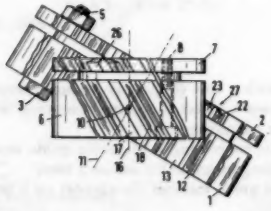
Dieter Buschmeier, Kirchheim, Fed. Rep. of Germany, assignor to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Filed Nov. 19, 1985, Ser. No. 799,539

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1984, 3442830

Int. Cl.⁴ B24B *53/00*

U.S. Cl. 125—116 D **6 Claims**



1. In a gearlike tool for the precision working of the flanks of gears, the teeth of which have an abrasive surface free of any uniformly directed cutting edges, the improvement comprising wherein at least one guide gear is arranged in a coaxial relationship to said tool, wherein adjusting means are provided for permitting a relatively rotatably connection of said tool and said guide gear together to maintain said coaxial relationship and to prevent a relative rotation from occurring during a precision working task, wherein a guide pinion is arranged in a coaxial relationship to a dressing tool and wherein securement means are provided for fixedly and nonadjustably connecting said guide pinion and said dressing tool together to main⁴ain said coaxial relationship, teeth on said guide gear meshingly engaging, during dressing, teeth on said guide pinion while teeth on said dressing tool simultaneously meshingly engage teeth on said tool, wherein said teeth of said guide gear, said guide pinion, said dressing tool and said tool extend axially, said teeth of said guide gear being adjustably angularly offset from said teeth on said tool a first distance to thereby limit the amount of material to be removed from said tool by said dressing tool as said teeth meshingly roll on each other.

4,693,232

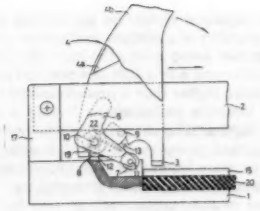
TILE-CUTTING MACHINE

Masaki Yasuga, 21-Go, 15-Ban, Minami 3-chome, Oimazato-Higashinari, Osaka, Japan

Filed Apr. 11, 1986, Ser. No. 850,762

Int. Cl.⁴ B28D *1/32*

U.S. Cl. 125—23 T **6 Claims**



1. A tile-cutting device comprising a base for supporting a tile, an upright post at each end of said base, a guide rail extending between and supported by said posts above said base, and a lever handle having at its lower end a cavity through which said rail passes, said tile-cutting device characterized by the provision of:

a. an elbow member having first and second arms disposed at an angle relative to each other, said first arm being bifurcated having two branches extending upwardly into the handle cavity between said handle and said rail, one branch on each side of said rail;

b. means at the apex of said elbow member securing said elbow member pivotally to said handle; and

c. a cutter at the lower end of said second arm.

4,693,233

AIR PREHEATER SYSTEM

Hugo C. Meith, and Stanley A. McHugh, both of Houston, Tex., assignors to Energy Technology, Inc., Houston, Tex.

Filed Apr. 3, 1986, Ser. No. 847,927

Int. Cl.⁴ F24H *3/12*

U.S. Cl. 126—117 **4 Claims**

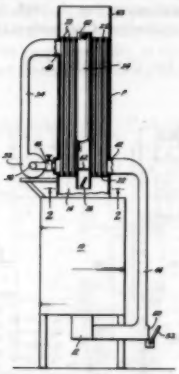
1. A preheater system, comprising:

a combustion chamber;

a preheater located above the combustion chamber and having a series of parallel substantially vertical preheater tubes to provide a substantially straight flow path for combustion gas for the full length of each of said tubes;

means for controlling the velocity and temperature of the combustion gas as it flows in said substantially straight flow path for the full lengths of the tubes to sweep liquid droplets out of the tubes with the combustion gas as it exits from the tubes to inhibit corrosion of the interior of the tubes by liquid droplets; and

said means for controlling the velocity and temperature of the combustion gas controlling the temperature of the preheater tubes between about 10° F. to about 100° F. below the dew point of the combustion gas and also con-



trols the gas velocity in a range from about 10 ft./sec. to about 100 ft./sec., with such velocity varying in amounts which substantially correspond to the variations in the tube temperature range.

4,693,234

APPARATUS FOR AND METHOD OF BURNING AND/OR THERMALLY DECOMPOSING FUEL, ESPECIALLY SOLID FUELS

Nils Tunströmer, Mullsjö, Sweden, assignor to Stubinen Utveckling AB, Stockholm, Sweden

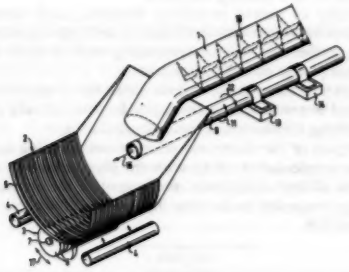
PCT No. PCT/EP85/00239, § 371 Date Mar. 13, 1986, § 102(e) Date Mar. 13, 1986, PCT Pub. No. WO85/05434, PCT Pub. Date Dec. 5, 1985

PCT Filed May 20, 1985, Ser. No. 827,977

Claims priority, application Fed. Rep. of Germany, May 21, 1984, 3418864

Int. Cl.⁴ F23H *9/04*

U.S. Cl. 126—155 **9 Claims**



1. An apparatus for burning and/or thermally decomposing fuel, especially solid fuels such as peat, coal, wood, straw or refuse, said apparatus comprising:

means for supplying fuel to said apparatus;

a bar grate including a plurality of bars for supporting said fuel a material loosening means mounted adjacent said bar grate, said material loosening means including disks protruding between the grate bars and mounted on a common support shaft that extends perpendicular to the grate bars, said disks being mounted on said shaft at spaced locations along said shaft so that a clearance exists between adjacent disks;

means for causing relative movement between said bar grate and said material loosening means in the direction of said grate bars;

wherein said relative movement causes said material loosening means to act on said fuel to loosen said fuel.

4,693,235

GAS HEATING PROCESS AND APPARATUS

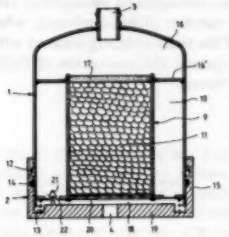
Jean L. Vigneau, Varilhes, and Pierre Trenque, Ramonville St Agne, both of France, assignors to Duffour et Igon S.A. (D.I.), Toulouse, France

Filed Nov. 21, 1985, Ser. No. 800,381

Claims priority, application France, Nov. 23, 1984, 84 17850

Int. Cl.⁴ F24J *1/00*

U.S. Cl. 126—263 **18 Claims**



1. A process for heating a gas, which comprises the steps of:

placing soda-lime in a chamber containing a predetermined amount of carbonic gas;

contacting said predetermined amount of carbonic gas with said soda lime so as to initiate an exothermic reaction therebetween;

passing a gas to be heated and a second amount of carbonic gas continuously into said chamber and over said soda-lime so as to maintain said reaction and heat said gas to be heated by heat produced from said reaction; and

withdrawing heated gas from said chamber.

4,693,236

CLOSURE APPLIANCE FOR USE IN CONNECTION WITH SURGICAL OSTOMY

Leonardo Leprevost, Pasaje Maluquer, 9 Barcelona, Spain

Continuation of Ser. No. 617,538, Jun. 5, 1984, abandoned. This application Feb. 28, 1986, Ser. No. 834,515

Claims priority, application Spain, Jun. 9, 1983, 272.994; Nov. 9, 1983, 275.834; Feb. 27, 1984, 277.753

Int. Cl.⁴ A61B *19/00*

U.S. Cl. 128—1 R **17 Claims**

17. A closure appliance for use in cases involving surgical ostomy which comprises

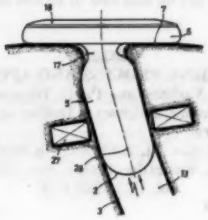
a magnetic ring adapted to be implanted in a patient in the surrounding skin of a stoma,

a body formed by an upper member adapted to be disposed on the outside of the stoma and a lower member adapted to extend inside the stoma, said upper and lower members being securely joined together by an intermediate area of reduced cross section forming a flexible, elastic joint which allows relative angular movement between said two members in a rotula manner,

a magnetic element incorporated in the wall of said lower member, which interacts with said magnetic ring to cause

a seal to form between the stoma and the lower member wall and

at least one passageway extending through said body and providing communication between the upper member and the bottom of the lower member, said upper member



containing a cavity which communicates with the interior of the stoma through said passageway extending through the lower member of the appliance, whereby the lower member of the body is tightly secured within the stoma to selectively permit the evacuation of fluids from the interior of the stoma.

4,693,237

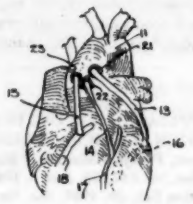
RADIOPAQUE CODED RING MARKERS FOR USE IN IDENTIFYING SURGICAL GRAFTS

Richard B. Hoffman, 73 Portugese Bend Rd., and Jonathan B. Po, 68 Portugese Bend Rd., both of Rolling Hills, Calif. 90274

Filed Jan. 21, 1986, Ser. No. 820,307

Int. Cl.[4] A61B *19/00*

U.S. Cl. 128—1 R **5 Claims**



1. A surgical procedure for radiographically identifying each site and destination of a surgical bypass graft comprising the steps of:

providing a plurality of marker members in the form of bands of a radiopaque material, each of said marker members having a different geometrical configuration, each of such configurations adapted to identify a different preselected graft destination,

placing each of said differently geometrically configured marker members around a different graft section at the site of the origin of the graft which its configuration is adapted to identify, and

suturing said markers in place at said graft sites to identify each such destination by virtue of the different geometrical configuration of each of said marker members.

4,693,238

MAGNETOTHERAPEUTIC IMPULSE DEVICE

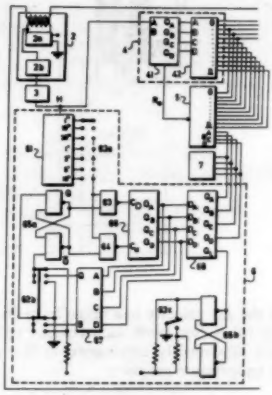
Jiri Jerabek, Prague, Czechoslovakia, assignor to TELSA, koncernovy podnik, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 515,940, Jul. 20, 1983, abandoned. This application Sep. 3, 1985, Ser. No. 772,246

Claims priority, application Czechoslovakia, Jul. 20, 1982, 5549-82

Int. Cl.[4] A61B *17/52*

U.S. Cl. 128—1.5 **7 Claims**



1. Circuit arrangement of a magnetotherapeutic impulse device for treatment of spondylitis, e.g. Bechterew's disease, comprising a voltage source; and circuit means for voltage adjustment;

an electronic selector switch having a plurality of outputs, a zero input and a clock input; a multiplexor; and multiplexor control means, said multiplexor control means also having a clock input;

the circuit means for voltage adjustment being connected by its input to the voltage source and by its output both to the clock input of the electronic selector switch and to the clock input of the multiplexor control means;

a plurality of phasing elements, each output of the electronic selector switch being connected to a corresponding input of one of said phasing elements;

a plurality of power switching elements, each having a control input, the output of each of said phasing elements being connected to a corresponding control input of one of said power switching elements;

a plurality of electromagnet coils each one of which is connected in series with a corresponding one of said power switching elements and the voltage source;

the outputs of the electronic selector switch being furthermore connected, starting with the second output, to the inputs of the multiplexor, the output of the multiplexor being connected to the zero input of the electronic selector switch.

4,693,239

ORTHOSIS

William M. Clover, Jr., Trabuco Canyon, Calif., assignor to Orthomedics, Inc., Brea, Calif.

Filed Jan. 21, 1986, Ser. No. 820,037

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—80 F **8 Claims**

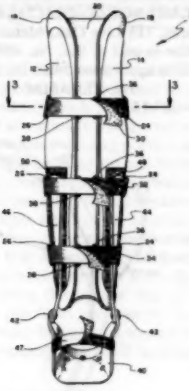
1. A lower leg orthosis for supporting the lower leg comprising:

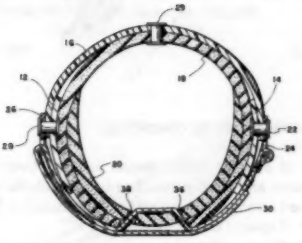
a semi-rigid shell provided with an anterior opening, such that said shell is open across that area of the shell where the anterior part of the leg is adapted to be positioned, and

having posterior, medial and lateral portions, the medial and lateral portions each being coupled to the posterior portion;

a first soft flexible material, more flexible than the semi-rigid shell, being disposed within said shell and adapted to enclose the lateral, medial and posterior parts of the leg;

a second soft flexible material, said second material having substantially the same flexibility as the first flexible material, said second material also being more flexible than said





semi-rigid shell, said second material being wider than the width of said anterior opening when the orthosis is positioned on a leg so as to be adapted to be disposed partially within said shell and to enclose the anterior part of the leg, the exposed portion of said second flexible material being free of any additional material which substantially decreases its flexibility; and

means for urging the lateral and medial shell parts toward each other to secure said shell and flexible materials around the leg.

4,693,240

ORTHOPAEDIC FRACTURE FIXATION APPARATUS

Mervyn Evans, Kidlington, England, assignor to National Research Development Corporation, London, England

Filed Apr. 12, 1985, Ser. No. 722,387

Claims priority, application United Kingdom, Apr. 12, 1984, 8409564

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—92 Z **5 Claims**

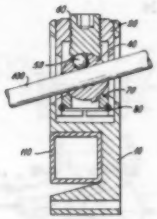
1. For an external orthopaedic fracture fixation apparatus, a clamp comprising:

a housing element having one end portion hollowed to serve as a cylinder; said portion having a pair of diametrally opposed apertures for passage of a pin therethrough, and said apertures being elongated axially of said cylinder;

a slide element of generally open-ended tubular form located in keyed manner in said housing element cylinder for non-rotatable axially reciprocal movement therein as a piston, said slide element having a pair of diametrally opposed apertures aligned with, but axially shorter than, those of said housing element for receipt of the pin, said slide element being axially slotted through one end portion thereof, and said slide element having an inward projection circumferentially around said one end portion;

an annular thrust member coaxially located in said slide element to seat on said inward projection;

a rotation element rotatably located in said slide element to



seat on said thrust member oppositely from said projection, said rotation element having a bore therethrough aligned with said housing element apertures and said sliding element apertures for receipt of the pin, and said rotation element having at least one slot extending therethrough from its exterior to its bore; and

a locking screw axially threadably engaged in said slide element oppositely from said one end portion, said screw being operably movable into said slide element to engage said rotation element to act on said thrust member thereby to urge said thrust member against said projection and to lock said slide element by expansion in said housing element, and simultaneously to lock said rotation element and a pin passing therethrough by compaction of said rotation element between said screw and thrust members.

4,693,241

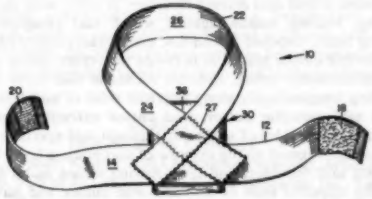
ELASTIC BANDAGE KNEE SUPPORT

Amalia Trznadel, 32 St. Kolby Dr., Holyoke, Mass. 01040

Filed Jul. 21, 1986, Ser. No. 887,446

Int. Cl.[4] A61F *13/00*

U.S. Cl. 128—157 **6 Claims**



1. An elasticized leg encircling bandage knee support for placement at the knee joint of a wearer comprising:

a first elasticized horizontally-disposed strap having opposite free ends;

a second elasticized strap formed in a loop and having crossed ends fixed centrally of the first strap, the loop being disposed vertically relative to the first strap and adapted to encircle the leg of a wearer;

releasable fastening means on the free ends of the first strap permitting releasable interengagement of the free ends with each other when the strap encircles the leg of a wearer;

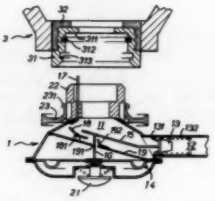
a semi-resilient pad releasably and adjustably fixed to the first and second straps in any selected pressure-exerting position of orientation.

4,693,242

COUPLING CONNECTORS FOR RESPIRATOR MASKS

Jacques Biard, Montreuil, France, assignor to Fenzy S.A., Montreuil, France

Filed Mar. 15, 1983, Ser. No. 475,634
Claims priority, application France, Apr. 2, 1982, 82 05706
Int. Cl.[4] A62B 7/04
U.S. Cl. 128—204.26 **11 Claims**



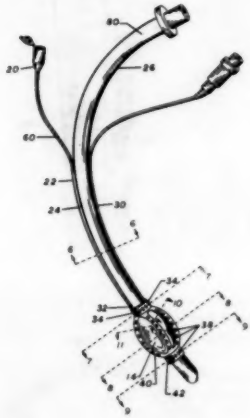
1. In a coupling connector attachable to and detachable from the snout of a respirator mask comprising a housing enclosing a body defining a control chamber having first and second ends, said housing having outlet means adapted to be connected to said snout and be in communication with the mask when in said connected position, said first end of said chamber being in communication with said outlet means, tube means connected to said housing for connection of a source of pressurized breathing gas, a control valve means in said housing to admit or shut off a main flow of gas under pressure from said tube means to said outlet means, biasing means applying a predetermined biasing force on said control valve means to maintain said control valve means in a closed position, said control valve means further comprising a pressure-sensing control diaphragm delimiting the control chamber at the second end thereof, an interlinkage chamber delimited at one side and separated from said control chamber by said pressure-sensing control diaphragm, an interlinkage jet leading into said interlinkage chamber, a return spring mounted between said first end of said control chamber and said pressure-sensing control diaphragm for pushing said control diaphragm towards the interlinkage jet; the improvement in which said control valve means includes a complementary spring, mounted within said control chamber, in series with the return spring, bearing means, against which said complementary spring bears, disposed at said first end of said control chamber, a movable cursor placed in between the return spring and the complementary spring, aperture means in said body and extending longitudinally along opposite sides of said body adjacent said movable cursor, said cursor extending exteriorly from opposite sides of said body through said aperture means, a shoulder formed on the exterior of said body, a lever bearing against said shoulder, said lever having at one end a fork engaging opposite ends of said movable cursor and having an opposite end, a feeler member which is constrained outside said body and inside said housing in a first position when said mask is connected to said snout to engage said opposite end of said lever to apply a force against the complementary spring thereby deactivating the complementary spring when said outlet is connected to said snout and freely movable to a second position when said mask is disconnected from said snout whereby both springs are then stressed which causes said pressure sensing diaphragm to close said interlinkage jet as long as said pressure-sensing control diaphragm senses a pressure equal to or greater than said ambient pressure when said outlet is disconnected from said snout.

4,693,243

CONDUIT SYSTEM FOR DIRECTLY ADMINISTERING TOPICAL ANAESTHESIA TO BLOCKED LARYNGEAL-TRACHEAL AREAS

Sharon Y. Buras, 713 Live Oak, Metairie, La. 70005

Continuation-in-part of Ser. No. 458,074, Jan. 14, 1983, abandoned. This application Mar. 26, 1986, Ser. No. 844,110
Int. Cl.[4] A61M 25/00
U.S. Cl. 128—207.15 **12 Claims**



1. A medical system, comprising:

a tubular member;

a pair of annular collar means inserted over said tubular member and fixedly attached to said tubular member in a spaced arrangement on said tubular member for forming a pair of spaced collar means;

an imperforate inflatable annular cuff member disposed over said tubular member between said collar means;

means along said tubular member for communicating with the interior of said cuff member to inflate said cuff member from a first uninflated configuration, to a second configuration having a sealing engagement with the laryngotracheal area of a human body; and

a flexible self-supporting conduit system connected between said collar means and disposed longitudinally over said cuff member;

open passage means in said conduit system when said cuff member is expanded to its second configuration, said open passage means allowing said cuff member to have a constant second inflated configuration to apply a constant pressure on the laryngotracheal area;

a plurality of openings in said conduit system communicating said open passage means with the laryngotracheal area sealingly engaged around said cuff member when said cuff member is expanded to its second configuration;

means along said tubular member communicating with said open passage means for communicating surgical fluid through said open passage means and through said openings into the laryngotracheal area sealingly engaged around said cuff member when said cuff member is expanded to its constant second configuration.

4,693,244

MEDICAL AND SURGICAL LASER PROBE I

Norio Daikuzono, Ichikawa, Japan, assignor to Surgical Laser Technologies, Inc., Cincinnati, Ohio

Continuation of Ser. No. 612,672, May 22, 1984, abandoned.
This application Nov. 17, 1986, Ser. No. 931,935
Int. Cl.[4] A61B *17/35*
U.S. Cl. 128—303.1 8 Claims

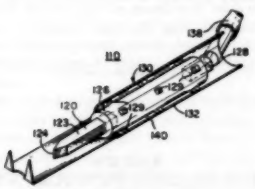
1. A medical and surgical laser probe for contact laser surgery; the probe optically connected to a laser source through an optical laser guide means; which probe is characterized in that the probe is made of an optically transparent solid material and comprised of a laser beam receiving portion and a tapered portion having a laser beam emitting tip end face; the tapered portion defining cross-sections of generally circular form having no surgical cutting edges along the tapered length thereof, and the length and the taper angle of the tapered portion and the radius of the tip end face of the tapered portion are determined and structural so that substantially all laser beam incident on the laser beam receiving portion from the laser beam guide means is emitted from the tip end face of the tapered portion without leaking out from the tapered face of the tapered portion; the laser beam being concentrated at the tip end face whereby said concentrated laser beam facilitates the surgical cutting of tissue.

4,693,245

NUCLEUS SPLITTER

David S. C. Pao, 95 High Point Dr., Churchville, Pa. 18966

Filed Oct. 1, 1985, Ser. No. 782,490
Int. Cl.[4] A61F *17/32*
U.S. Cl. 128—305 6 Claims



1. A nucleus splitter device comprising:

(a) a hollow tubular body having a central axis;

(b) an elongated member slidable within said tubular body along said axis, said elongated member including an end portion having a receiving means;

(c) a platform structure extending from one end portion of the hollow tubular body;

(d) a projecting member supported by said platform structure at an end of said platform remote from the tubular body and adapted for immobilizing a nucleus of a lens, in vivo,

said projecting member having a plurality of projecting tines for piercing and holding said nucleus;

(e) a solid, penetrating tip for splitting said nucleus,

said penetrating tip being removably inserted in said receiving means of said elongated body,

said penetrating tip including a progressively decreasing cross-section ending with a single piercing portion;

(f) a plunger means reciprocally mounted within said hollow tubular body,

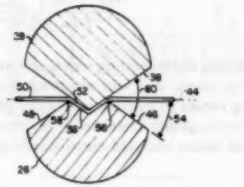
said plunger means including an end portion arranged to abut said elongated member to effect displacement thereof within said hollow tubular body whereby said penetrating tip is displaced in one direction only, to effect a controlled fragmentation of said nucleus.

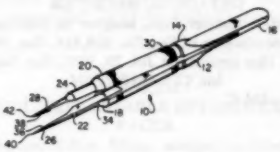
4,693,246

SUTURE TYING FORCEPS

Harry G. Reimels, Braintree, Mass., assignor to Mentor D & O, Inc., Norwell, Mass.

Filed Apr. 5, 1985, Ser. No. 720,505
Int. Cl.[4] A61B *17/28*
U.S. Cl. 128—321 5 Claims





1. Suture tying forceps comprising:

(a) a pair of gripping arms integrally joined at one end, with the free ends thereof being normally in radially spaced relation;

(b) a pair of members respectively secured in said free ends of said pair of gripping arms and terminating in a pair of suture tying tips;

(c) said pair of suture tying tips formed with respective complementary mating surfaces designed to clamp a suture therebetween;

(d) one of said pair of suture tying tips having a longitudinal U-shaped groove providing a cross sectional configuration comprising a U-shaped clamping surface and a pair of substantially flat planar flexing surfaces being contiguous with and extending downwardly from said U-shaped clamping surface;

(e) the other of said pair of suture tying tips having a cross sectional configuration comprising a longitudinal U-shaped form in its central region and a second pair of substantially flat planar flexing surfaces being contiguous with and extending upwardly from said U-shaped form.

4,693,247

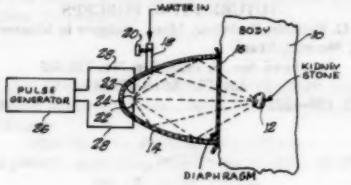
TRIGGERING CIRCUIT

Alfred G. Brisson, Kildeer, and Christopher Nowacki, Arlington Heights, both of Ill., assignors to Trutek Research, Inc., Lake Zurich, Ill.

Filed Sep. 29, 1986, Ser. No. 912,959
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—328 5 Claims

1. The combination for the extracorporeal disintegration of calculi such as kidney stones comprising a reflector having a fluid therein adapted to be coupled to a body having a heart and a calculus such as a kidney stone, means in said reflector for generating a wave in said fluid, said reflector being positioned to focus said wave on said calculus in said body, ultra-

sound means for detecting when said heart is undergoing a ventricular contraction, electrocardiogram means for detecting when said heart is undergoing a ventricular contraction, a triggering circuit for operating said wave generating means to



generate a calculus disintegrating wave, and means connecting said ultrasound means and said electrocardiogram means to said triggering means to operate said wave generating means only when ventriculating contraction is detected by both of said ultrasound means and said electrocardiogram means.

4,693,248

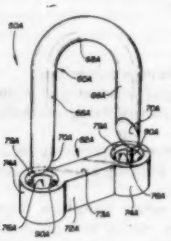
TWO-PIECE TISSUE FASTENER WITH DEFORMABLE RETAINING RECEIVER

Stephen J. Failla, Chester, N.J., assignor to Ethicon, Inc.

Continuation-in-part of Ser. No. 506,144, Jun. 20, 1983, abandoned. This application Jul. 29, 1985, Ser. No. 759,795

Int. Cl.[4] A61B *17/04*

U.S. Cl. 128—334 C **9 Claims**



1. A polymeric fastener adapted to hold together two portions of mammalian tissue, such as are defined by a wound or incision, to facilitate healing of the wound or incision, said fastener comprising:

an open loop fastening member comprising a pair of legs with distal ends adapted to penetrate said tissue portions and a link connecting said legs that is adapted to be disposed adjacent one of said tissue portions, said legs being smooth and free of projections; and

a receiver adapted to be disposed against the other of said tissue portions opposite said fastening member, said receiver defining one passage therein for receiving one of said fastening member legs after said legs have been inserted through said tissue portions and defining another passage therein for receiving the other of said fastening member legs after said legs have been inserted through said tissue portions, said receiver further defining a plurality of deformable projections spaced peripherally around the interior surface of each said passage for being deformed as one of said legs is received in said passage to thereby effect an interference fit engagement between the exterior surface of the fastening member legs and the deformable projections and inhibit withdrawal of said leg from said receiver, said receiver being rigid and non-deformable except for said projections.

4,693,249

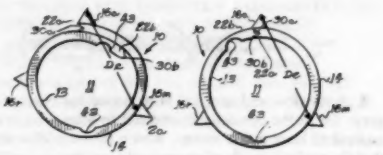
ANASTOMOSIS DEVICE AND METHOD

Robert R. Schenck, 1100 N. Lake Shore Dr., Aptmt. 33A, Chicago, Ill. 60611, and Harry P. Weinrib, 2644 West Estes Ave., Chicago, Ill. 60645

Filed Jan. 10, 1986, Ser. No. 817,825

Int. Cl.[4] A61B *17/04*

U.S. Cl. 128—334 R **20 Claims**



1. An anastomosis device for interconnecting the ends of first and second living vessels without tearing the same, said device comprising:

a ring-like body of biologically compatible material having flexibility to change its shape between a smaller size at a contracted state and a larger size at an expanded state,

said ring-like body being split and having separable ends,

a plurality of points on the ring-like body for impaling the ends of the first and second living vessels in apposition on the exterior of the ring-like body.

said ring-like body being biased to one of said states and being moved by the surgeon to the other of its states.

a first of said points being a primary point located adjacent one of said separable ends and being at a predetermined distance relative to a second remote one of said points when the ring-like body is in its contracted state, said remote point adapted to be impaled before the primary point, said primary point moving with the adjacent end to a distance greater than said predetermined distance and being the last of the points to be impaled prior to the ring-like body moving to its expanded state.

4,693,250

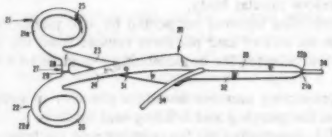
METHOD FOR DILATING PUNCTURE SITE IN THE RENAL PELVIS

Harold G. Coons, San Diego, Calif., assignor to Cook, Incorporated, Bloomington, Ind.

Filed Jan. 29, 1986, Ser. No. 823,767

Int. Cl.[4] A61M *29/00*

U.S. Cl. 128—345 **9 Claims**



5. A process for dilating a puncture site in tissue to allow for insertion of instruments therein, comprising the steps of:

sliding a clamp having jaws with a channel defined therein for receipt of the wire guide along a wire guide inserted in a puncture in tissue until the jaws are within the puncture; and,

enlarging the puncture by opening the jaws.

4,693,251

CLIP FOR THE OCCLUSION OF AN OVIDUCT OR VAS DEFERENS

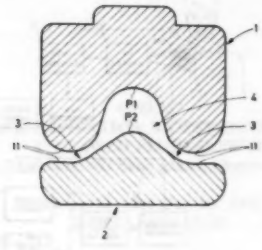
Waldemar Bleier, Saarlouis; Theodor Lutze, Balgheim, and Harald Stallforth, Tuttlingen, all of Fed. Rep. of Germany, assignors to Aesculap-Werke AG, Tuttlingen, Fed. Rep. of Germany

Filed Dec. 3, 1985, Ser. No. 804,160

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1984, 3445874

Int. Cl.[4] A61B *17/28*

U.S. Cl. 128—346 1 Claim



1. A clip for the occlusion of an oviduct or vas deferens by clamping, consisting of two parts (branches) to be placed transversely to the duct to be clamped and a latching means, said parts exerting pressure on the section of duct (duct section) positioned between them, said pressure being generated by closure of the latching means and causing occlusion of the duct (duct occlusion), wherein the improvement comprises

the surfaces of the two branches facing the duct section or one another, respectively, have profiles of the type that a pressure effecting duct occlusion may be generated only in two separate regions of said branches while a cavity relieving pressure on said duct and allowing nourishment of its tissue is formed between said two pressure zones,

the substantially wave-like branch profiles having curvatures which are as slight as possible in each sectional plane extending vertically through said duct and having no projecting ridges so as to avoid clamping the tissue under said profiles in a manner that would prevent nourishment of the tissue,

said nutrition zone being continued on both sides of the duct section at right angles thereto and opening outwardly at the two shorter lateral faces or end faces of the clip,

and said clip comprising an upper part having extensions at both ends, said extensions being provided with catch detents, and a lower part having resilient members at both ends, said arms corresponding to said locking members and also being provided with catch detents, in such a manner that when said closing bridge is pressed into said lower part said catch detents of said locking members and said closing arms engage one another and form a self-locking closure of the two parts.

4,693,252

DEVICE FOR GENERATING DRY, COLD GAS FLOW

Klemens Thoma, Krefeld-Huls, and Wolfgang Volker, Tonisvorst, both of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Fed. Rep. of Germany

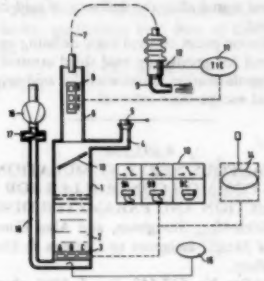
Filed Jan. 22, 1986, Ser. No. 821,347

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1984, 3506932

Int. Cl.[4] A61F *7/00*

U.S. Cl. 128—400 7 Claims

1. In a device for generating a dry cold gas flow by evaporating a low-boiling liquefied gas for cold thereapy for rheumatic diseases, with a vessel for accomodating the low-boiling liquefied gas, a hose line one end of which is connected to the vessel, and a plurality of interchangeable treatment nozzles of different cross sections for distribution of the evaporated gas attachable to the other end of the hose, the improvement being in that said vessel has only a small storage volume, the bottom of said vessel being provided with an adjustable electrical heater for evaporation of the liquefied gas, means for adjusting



the output of said electrical heater to ensure essentially the same gas exiting speed regardless of which nozzle is attached, and said one end of said hose line being connected to said vessel by means of an adjustable electrical heating line for heating the evaporated gas to the desired temperature.

4,693,253

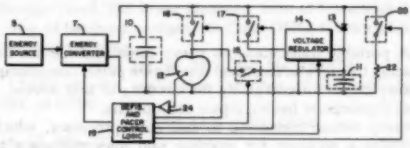
AUTOMATIC IMPLANTABLE DEFIBRILLATOR AND PACER

Theodore Adams, Edina, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 23, 1981, Ser. No. 246,528

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 D 4 Claims



1. An implantable defibrillator and pacer for cardioverting and pacing a patient's heart comprising:

a lead system for coupling the patient's heart to said defibrillator and pacer and for delivering cardioverting and pacing energy to the heart;

a sense amplifier for coupling to the heart for detecting the depolarization of cardiac tissue;

first energy storage means for storing both said cardioverting energy and pacing energy;

a primary energy source means for supplying energy to said first energy storage means;

an energy converter coupled to said primary energy source and said first energy storage means for supplying energy to said first energy storage means at a voltage higher than the voltage of said primary energy means;

second energy storage means for storing said pacing energy;

first switch means coupled to said first energy storage means for delivering said cardioverting energy to said lead system in response to a first control signal;

a voltage regulator coupled to said first storage means for charging said second storage means in response to a second control signal;

a second switch means for coupling said second energy

storage means to said lead system in response to a third control signal;

defibrillation and pacer control logic coupled to said sense amplifier for detecting fibrillation, and for producing said first control signal in response to the detection of fibrillation;

said defibrillation and control logic for producing said second control signal after the delivery of said cardioverting energy; and,

said defibrillation pacer control logic defining an escape time interval and for producing said third control signal if no cardiac depolarization is detected by said sense amplifier during said escape time interval.

4,693,254

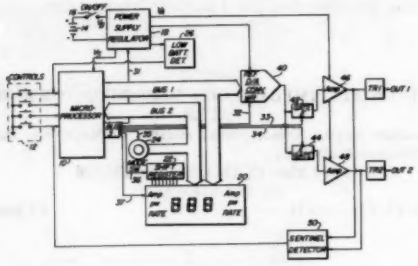
TRANSCUTANEOUS NERVE STIMULATION DEVICE USING A COMMON CONTROLLER FOR PULSE PRODUCTION AND PARAMETER DISPLAY

Stanley P. Mickiewicz, Stoughton, and Alan Coombes, Hingham, both of Mass., assignors to Codman & Shurtleff, Inc., Randolph, Mass.

Continuation of Ser. No. 617,442, Jun. 5, 1984, abandoned. This application Sep. 17, 1986, Ser. No. 910,271

Int. Cl.[4] A61N *1/32*

U.S. Cl. 128—421 **18 Claims**



1. A portable transcutaneous nerve stimulation device for producing therapeutic electrical stimulation pulses comprising:

battery means for energizing the circuitry of said device;

a microprocessor having inputs and outputs;

memory means, connected to said microprocessor, which retains a program for enabling said microprocessor to control treatment pulse production and treatment parameter display in a time-shared manner;

output pulse circuitry having an input coupled to outputs of said microprocessor and an output at which treatment pulses are produced;

a display having inputs coupled to ones of said outputs of said microprocessor and continuously responsive to signal levels at said outputs of said microprocessor for displaying treatment parameters; and

means for applying treatment parameters to an input of said microprocessor.

4,693,255

MEDICAL APPARATUS METHOD FOR ASSESSING THE SEVERITY OF CERTAIN SKIN TRAUMAS

Harry C. Beall, 1008 Horton Rd., Durham, N.C. 27704

Filed Apr. 22, 1985, Ser. No. 726,015

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—654 **8 Claims**

1. A method of objective analysis of the condition of traumatized surface tissue of a patient, comprising the steps of:

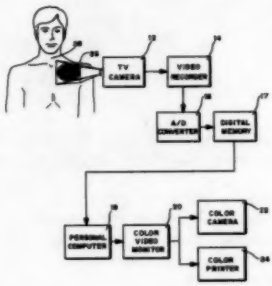
introducing a tracer dye into the patient;

scanning the surface area of said traumatized surface tissue with a television camera for about 1-20 minutes after introduction of the dye to detect the rate of non-reflective perceptible extrinsic changes in the surface area due to the initial appearance of the dye;

recording analog signals from the television camera on a video recorder;

digitizing a pre-selected plurality of static images on the video recording and storing the digitized data for each of said plurality of images in an electronic memory;

computer processing of the digitized signals by systematically comparing consecutive corresponding digital data from the stored digital data representing the plurality of static images and calculating the rate of change of surface



area appearance of corresponding sections of surface area of the plurality of static images and then storing the new digital data;

computer generating a two-dimensional map of the traumatized surface tissue by first assigning a color code to each of a predetermined plurality of change rates and then generating a two-dimensional color coded mapping of the traumatized surface tissue with each color representing an assigned change rate; and

displaying the two-dimensional color coded map of the traumatized surface tissue on a color display monitor.

4,693,256

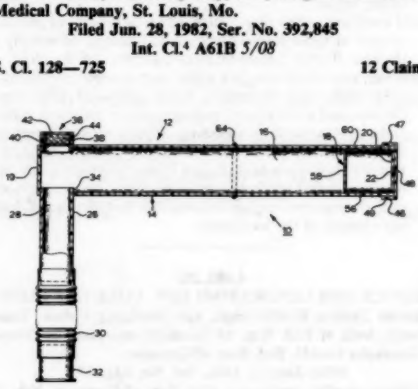
RESPIRATORY DEVICE

Daniel A. Talonn, University City, Mo., assignor to Sherwood Medical Company, St. Louis, Mo.

Filed Jun. 28, 1982, Ser. No. 392,845

Int. Cl.[4] A61B *5/08*

U.S. Cl. 128—725 **12 Claims**



1. A spirometer comprising a chamber, piston means sealingly slidable in said chamber, first and second air flow resistive orifice means connecting said chamber respectively on one and the opposite sides of said piston means in fluid flow communication with the atmosphere, and passage means for connecting the lungs of a person in fluid communication with said chamber at said one side of said piston means to effect a pres-

sure in said chamber at said one side of said piston means proportional to the flow of air in said passage means generated by the lungs of the person, said piston means being movable in response to the pressure for providing an indication of the total volume of air moved by the lungs, said first orifice means having a first predetermined resistance to air flow therethrough, said second orifice means including means for selectively effecting predetermined second and third resistances to air flow through said second orifice means, each of said second and third resistances being greater than said first predetermined resistance.

4,693,257

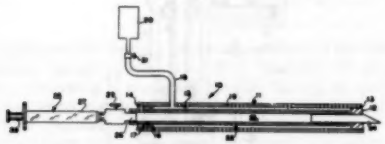
NEEDLE ASPIRATION BIOPSY DEVICE WITH ENCLOSED FLUID SUPPLY

Charles W. Markham, 667 Snug Island, Clearwater Beach, Fla. 33515

Filed May 12, 1986, Ser. No. 862,263

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—752 **10 Claims**



1. A sample taking device comprising,

an external guide catheter having a distal and a proximal end,

a rapidly opening and closing, normally closed, distal valve disposed at the distal end of said guide catheter,

an elongated hollow needle catheter, having a distal and a proximal end, telescopically disposed in said external guide catheter and extending proximally therefrom,

said guide catheter and needle catheter positioned in spaced apart, concentric relation to one another,

an elongate space existing between said guide catheter and said needle catheter,

sealing means at the proximal end of said guide catheter for sealingly connecting said guide catheter and said needle catheter while allowing relative telescopic movement to take place therebetween;

an aspirating syringe removably connected to the proximal end of said needle catheter;

a fluid source confluently connected to said guide catheter at a location intermediate said distal valve and said sealing means for supplying sample carrying fluid to said space,

said needle catheter having a sample taking needle on the distal end thereof whereby upon distal movement of said needle catheter relative to said guide catheter, said sample taking needle moves outwardly of said guide catheter through said distal valve, at which time vacuum supplied to said needle by said aspirating syringe will slightly bring a sample within said needle and upon return of said needle past said distal valve, which valve immediately closes, and into said space, the sample carrying fluid is adapted to flow into said needle and is adapted to be carried therein to said aspirating syringe,

said distal valve operative to retain said sample carrying fluid within said device at all times,

and said syringe and said fluid source being independent elements of said device.

4,693,258

SURGICAL ELECTRODE FOR CARDIAC PACING AND MONITORING

Peter Osypka, Grenzach-Wyhlen, and Hans Gerstmann, Lörrach, both of Fed. Rep. of Germany, assignors to Dr. Ing. P. Osypka GmbH Medizinelektronik, Grenzach-Wyhlen, Fed. Rep. of Germany

Filed Dec. 5, 1985, Ser. No. 805,978

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1984, 3445102

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—783 **24 Claims**

1. A surgical electrode comprising a lead wire arranged to extend from the thorax of a patient for connection to a medical instrument for cardiac pacing or monitoring purposes and having an elongated terminal portion; an electrically conductive elongated male connector having first and second ends and a transversely extending passage remote from said first end, said terminal portion having a first leg extending substantially longitudinally of said connector, an intermediate part in said passage and a second leg extending substantially longitudinally of said connector; and an electrically insulating female connector including an annular portion clampingly surrounding said male connector and said legs intermediate said passage and said first end, at least a portion of said male connector between said intermediate part and said second end being exposed.

4,693,259

SELF-PROPELLED HARVESTER THRESHER

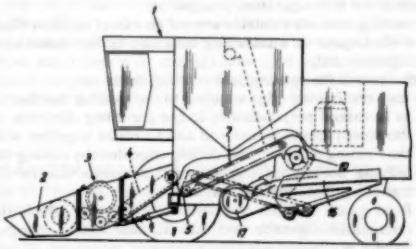
Theodor Freye, and Franz Heidjann, both of Harsewinkel, Fed. Rep. of Germany, assignors to Claas OHG, Harsewinkel, Fed. Rep. of Germany

Filed Jul. 10, 1985, Ser. No. 753,674

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1984, 3426790

Int. Cl.[4] A10F *7/04, 12/00*

U.S. Cl. 130—27 R **9 Claims**



1. A self-propelled harvester thresher, comprising a housing having two sides; threshing and separating means; flat sieve means arranged after said threshing and separating means as considered in a travelling direction; and a sieve drum extending transversely to the travelling direction between said threshing and separating means and said flat sieve means for acting on a straw-chaff-grain mixture, said sieve drum being located stationarily above said flat aieve means and having two ends, said sieve drum being provided with a feed opening at its one end and an outlet opening at its other end and with trans-

porting means for transporting the product from said feeding opening to said outlet opening; a product supply trough located between said threshing and separating means and said sieve drum; a transporting channel located outside of one side of said housing and having one end which faces toward said sieve drum and is connected with said feeding opening of said sieve drum, and another end which faces away of said sieve drum and is connected with said product supply trough; a grain-chaff returning member loacated immediately before said outlet opening of said sieve drum; and a screw located in said sieve drum and forming transporting means for transporting the product from said feeding opening to said outlet opening.

4,693,260

CONTINUOUS CIGARETTE ROD CUTTING APPARATUS FOR A CIGARETTE MAKING MACHINE

Yutaka Okumoto, Tokyo, Japan, assignor to The Japan Tobacco & Salt Public Corporation, Tokyo, Japan

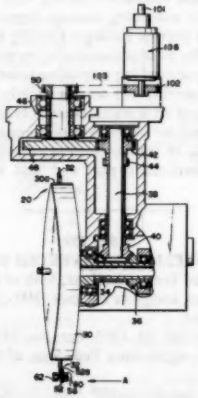
Filed Feb. 26, 1985, Ser. No. 705,809

Claims priority, application Japan, May 4, 1984, 59-88499

The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.

Int. Cl.[4] A24C *5/28*

U.S. Cl. 131—84.1 **7 Claims**



1. A cutting apparatus for cutting a moving continuous cigarette rod into cigarettes, comprising:

a rotating member rotatable around an axis of rotation tilted with respect to a travelling direction of the continuous cigarette rod;

drive means for rotating said rotating member;

at least one cutting edge attached to the rotating member so as to extend perpendicular to the travelling direction of the continuous cigarette rod and to rotate together with the rotating member, said cutting edge thereby cutting the moving continuous cigarette rod perpendicular to the travelling direction thereof; and

a fixed guide member having a hole through which the continuous cigarette rod travels, said guide member fixedly positioned adjacent a locus of movement of said cutting edge for sliding contact therewith and so that the cutting edge cuts the continuous cigarette rod during rotation thereof by said drive means, wherein said guide member has an inner surface located on the upstream side of the cutting edge with respect to the travelling direction of the continuous cigarette rod, the inner surface including a curved portion having a non-flat curvature conforming to the locus of movement of the cutting edge, said curvature providing a means for maintaining sliding contact with the cutting edge in response to adjustment of the cutting edge along the travelling direction of the rod, thereby preventing the cutting edge from vibrating in the direction of the thickness thereof.

4,693,261

CONTINUOUS CIGARETTE ROD CUTTING APPARATUS FOR A CIGARETTE MAKING MACHINE

Yutaka Okumoto, Musashino, Japan, assignor to The Japan Tobacco & Salt Public Corporation, Tokyo, Japan

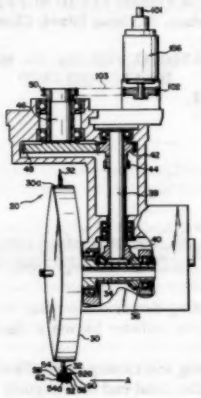
Filed Feb. 26, 1985, Ser. No. 705,890

Claims priority, application Japan, May 2, 1984, 59-87776

The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.

Int. Cl.[4] A24C *5/28*

U.S. Cl. 131—84.1 **8 Claims**



1. A cutting apparatus for cutting a moving continuous cigarette rod into cigarettes, comprising:

a rotating member rotatable around an axis of rotation tilted with respect to a travelling direction of the continuous cigarette rod;

drive means for rotating said rotating member;

at least one cutting edge attached to the rotating member so as to extend perpendicular to the travelling direction of the continuous cigarette rod and to rotate together with the rotating member, said cutting edge thereby cutting the moving continuous cigarette rod perpendicular to the travelling direction thereof; and

a pair of fixed guide members each having a hole through which the continuous cigarette rod travels and an inner surface, the respective inner surfaces of said two guide members facing each other at a space wider than the thickness of the cutting edge and fixedly positioned adjacent the locus of movement of said cutting edge wherein said pair of guide members includes a first guide member located on the upstream side with respect to the travelling direction of the continuous cigarette rod and a second guide member located downstream thereof, the inner surface of said first guide member including a curved portion having a non-flat curvature conforming to the locus of movement of the cutting edge, said curvature providing a means for maintaining sliding contact with the cutting edge in response to adjustment of the cutting edge along the travelling direction of the rod, thereby preventing the cutting edge from vibrating in the direction of the thickness thereof.

4,693,262

APPARATUS FOR FORMING BATCHES OF TOBACCO AND THE LIKE

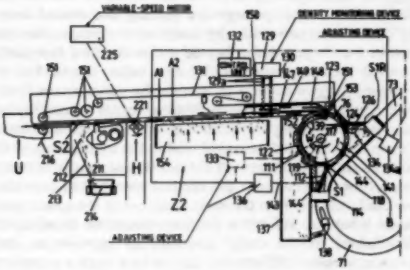
Manfred Goldbach, Hamburg; Siegfrid Marquardt, Westerau, and Jochim Myohl, Wentorf, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Mar. 5, 1986, Ser. No. 836,527

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1985, 3508499

Int. Cl.⁴ A24C *5/18, 5/25, 5/34, 5/39*

U.S. Cl. 131—84.3 **29 Claims**



1. Apparatus for forming batches from fibers of the tobacco processing industry, especially from particles of tobacco leaves, comprising a pneumatic conduit having an outlet; a source of fibers; means for supplying from said source to said conduit a continuous narrow stream of fibers so that such stream advances toward, through and beyond said outlet; and means for converting at least a portion of the stream into a series of batches adjacent to said outlet, comprising a rotary conveyor having a peripheral surface provided with a series of pockets and means for evacuating air from said pockets, said outlet being positioned to deliver at least the major portion of the stream to successive pockets of said rotary conveyor with a component of movement in the direction of rotation of the rotary conveyor whereby the fibers which enter said pockets accumulate into discrete batches.

4,693,263

METHOD AND APPARATUS FOR MAKING A COMPOSITE STREAM FROM FIBROUS MATERIAL OF THE TOBACCO PROCESSING INDUSTRY

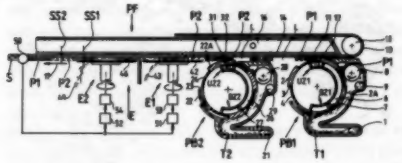
Günter Wahle, Reinbek, and Dieter Ludszeweit, Hamburg, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Mar. 5, 1986, Ser. No. 836,313

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1985, 3509612

Int. Cl.⁴ A24C *5/18, 5/39*

U.S. Cl. 131—84.4 **38 Claims**



1. A method of making a stream of smokable fibrous material, particularly a stream of tabacco, comprising the steps of accumulating first batches from a first smokable fibrous material; gathering second batches from a second smokable fibrous material; and shuffling the first and second batches to form a composite stream wherein first batches alternate with second batches.

32. A method of making a rod-like filler of smokable fibrous material, particularly a stream of tobacco, comprising the steps of accumulating first and second smokable fibrous materials into a composite stream wherein first batches of first smokable fibrous material alternate with second batches of second smokable fibrous material; and trimming the composite stream including removing first fibrous material from at least some of said first batches so that the thus trimmed first batches contain first quantities of first fibrous material, and removing second fibrous material from at least some of said second batches so that the thus trimmed second batches contain different second quantities of fibrous material.

4,693,264

TREATMENT OF TOBACCO

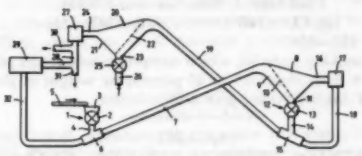
Roger W. Hedge, Lymington, England, assignor to British-American Tobacco Company Limited, London, England

Filed Jun. 13, 1986, Ser. No. 873,989

Claims priority, application United Kingdom, Jun. 15, 1985, 8515217

Int. Cl.⁴ A24B *3/18*

U.S. Cl. 131—296 **10 Claims**



5. Tobacco drying apparatus comprising a first duct, a first gas-flow passage in communication at a downstream end thereof with an upstream end of said first duct, a first tobacco feed path extending to and opening into said first gas-flow passage, first separator means in communication with a downstream end of said first duct, a second duct, a second gas-flow passage in communication at a downstream end thereof with an upstream end of said second duct, a second tobacco feed path extending from said first separator means to and opening into said second gas-flow passage, a gas-flow pipe extending from said first separator means and being in communication with the upstream end of said second gas-flow passage, and second separator means in communication with the downstream end of said second duct, said first separator means being functionable to receive gaseous medium and tobacco from said first duct, to permit said gaseous medium to pass substantially absent said tobacco to said gas-flow pipe and to permit said tobacco to pass substantially absent said gaseous medium to said second feed path.

4,693,265

CIGARETTE FILTER HAVING LOW VISIBLE STAINING

Alan B. Norman, Clemmons, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed May 19, 1986, Ser. No. 864,363

Int. Cl.⁴ A24D *3/04*

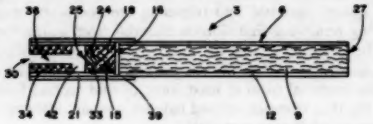
U.S. Cl. 131—340 **16 Claims**

1. A filter cigarette having in combination a cylindrical rod of smokable material, a cylindrical filter element having a front face and a back face and axially aligned in an end-to-end relationship with the rod such the front face of the filter element is adjacent one end of the rod, and a cylindrical mouthpiece element having a substantially tubular shape and axially aligned in an end-to-end relationship with the filter element;

wherein during draw, air and smoke entering the filter element from the rod exits the opposite end of the filter element;

the filter element includes a path of least resistance therethrough such that air and smoke exits the filter element at the back face thereof and in a region towards the periphery thereof;

the mouthpiece element has a longitudinally extending hollow region and a circumscribing wall having a thickness



such that the wall is axially aligned with the region where smoke and air exits the filter element;

the mouthpiece element and the filter element are positioned in a spaced apart relationship such that substantial amounts of air and smoke exiting the back face of the filter element travels through the hollow region of the mouthpiece element.

4,693,266

SMOKING MATERIAL

Robert G. Breckwoldt, Goshen, N.Y., assignor to Tripar Incorporated, Stamford, Conn.

Filed Mar. 3, 1986, Ser. No. 835,351

Int. Cl.[4] A24B *15/00, 15/10;* **A24D** *1/18*

U.S. Cl. 131—359 **2 Claims**

1. A smoking material, which comprises; tobacco in admixture with from about 0.5 to 80 percent by weight of the tobacco of distiller's dried gran with solubles.

4,693,267

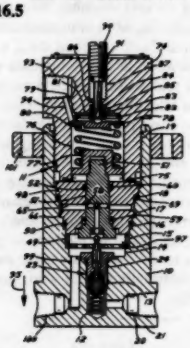
SELF-VENTING PRESSURE REDUCING REGULATOR

Daryll D. Patterson, Brooklyn Park, Minn., assignor to Tescom Corporation, Elk River, Minn.

Filed Mar. 31, 1986, Ser. No. 846,286

Int. Cl.[4] G05D *16/10*

U.S. Cl. 137—116.5 **11 Claims**



1. A pressure regulator adapted to be connected to sources of inlet and reference pressures and provide an outlet pressure that is higher than the reference pressure, comprising a regulator body having opposite first and second exterior surfaces, a main bore that is axially elongated, has a first end opening through the second surface, an axially opposite end [that is closed by the regulator body and is] axially intermediate said surfaces, a first end bore portion, a second bore portion that at least in part defines a main valve chamber, is of a larger *minimum* diameter than the first end bore portion and opens to the first end bore portion, a third bore portion having a minimum diameter larger than the maximum diameter of the second bore portion and opens thereto, and a fourth bore portion having a minimum diameter larger than the maximum diameter of the third bore portion, opens to the third bore portion and opens through the second surface, an inlet port that [is in fluid communication with] *opens through* the first bore portion *to the main bore,* an outlet port in fluid communication with the main chamber, and a vent passage that opens to the third bore portion and through the valve regulator body to the ambient atmosphere, *the regulator body having a wall portion closing the axial opposite end of the main bore,* operable main valve means mounted in the first bore portion that is resiliently retained in a closed condition to block fluid flow from the first bore portion to the main chamber and is operable to permit fluid flow from the first bore portion to the main chamber, a dome mounted by the body to extend within the fourth bore portion and having a dome chamber opening axially toward the third bore portion and a reference pressure passage opening to the ambient atmosphere and to the dome chamber, a sensor mount mounted by the body in fluid sealing relationship with the dome and body and having [as] *an* axially elongated bore opening to the dome chamber and the main chamber and a vent passage for placing the mount bore in fluid communication with the body vent passage, *the sensor mount at least in part being located within the third bore portion,* a control member mounted by the valve means for axial movement relative thereto to operate the valve means from its closed condition to an open condition, sensor means having a vent passage opening to the mount vent passage and toward the main chamber and extended within the mount bore in fluid sealing relationship therewith for movement axially between a first position spaced from the control member to provide an open fluid passage from the main chamber to the sensor mount passage when the reference pressure decreases in *relationship* [relatiohship] to the outlet pressure to provide an outlet reference pressure differential that is less than a preselected value whereby fluid flows from the main chamber to the vent passages and permits the valve means blocking fluid flow from the inlet port to the main chamber, a second position abutting against the control member to have the control member block fluid flow from the main chamber to the sensor means vent passage and the valve means remain in its closed condition when the pressure differential between the outlet and reference pressure is within a limited range of the preselected pressure differential, and a third position for cooperating with the control member to block fluid flow from the main chamber to the vent passages and operate the valve means to an open condition when the outlet pressure decreases to increase the pressure differential between the outlet and reference pressures more than a preselected amount, and spring means with the dome chamber for resiliently urging the sensor means toward the control member.

4,693,268

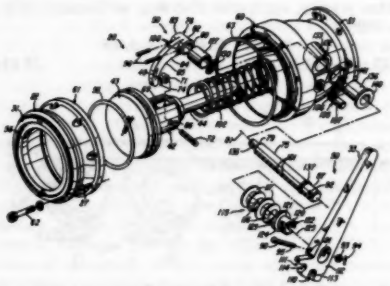
POPPET VALVE ASSEMBLY AND METHOD OF MAKING SAME

Richard L. Fahl, Fairfield, Ohio, assignor to Dover Corporation, New York, N.Y.

Filed Dec. 24, 1985, Ser. No. 813,250

Int. Cl.[4] F16K *1/12, 31/52, 35/02*

U.S. Cl. 137—219 **5 Claims**



1. In a poppet valve assembly comprising; a housing; a flow passage in said housing; said passage having a central axis and being adapted to flow fluid in either direction therethrough; a poppet structure for controlling fluid flow through said passage; said poppet structure having a head, a cylindrical stem of a particular diameter, and a longitudinal axis which coincides with said central axis; means supporting said poppet structure

during movement thereof along said axes; an actuator contact on said poppet structure between said head and said stem to enable movement of said poppet structure along said axes; and means for engaging said contact to provide said movement; the improvement in which said engaging means comprises a shaft carried by said housing for rotary movements thereof and an actuator detachably fastened to said shaft; said shaft and actuator having outer annular surfaces which together define the sole means engaging structural portions associated with said housing to hold said shaft and actuator against movements parallel to a central axis of said shaft while allowing said rotary movements of said shaft to enable said actuator to engage said contact; said engaging means comprising an actuating handle attached to one end of said shaft to provide said rotary movements of said shaft; and said poppet valve assembly further comprising, a stop on said housing for holding said handle in a plurality of open positions, recess means in an inner portion of said handle defining a plurality of holding surfaces on said inner portion which correspond in number to said plurality of open positions, said handle having means yieldingly urging said inner portion and hence said holding surfaces away from said stop whereby once said inner portion with its holding surfaces is urged away from said stop said poppet structure and valve assembly remain normally closed, a pin extending through aligned holes in said handle and in one end of said shaft to attach said handle to said shaft while allowing pivoting movements of said handle about said pin and thereby allow said inner portion of said handle and said holding surfaces to be pivoted away from said stop by said urging means, said urging means comprising spring means and a cooperating hub member carried concentrically around one end of said shaft, said hub member having a tubular end and transverse slot means provided in said tubular end, said hub member being installed on said shaft with said pin extending through said slot means whereby said hub member cannot rotate relative to said shaft, said hub member also having a central hub axis and a first annular surface disposed in a first plane which is perpendicular to said hub axis and a second annular surface disposed in a second plane which is at an angle to said hub axis, and said second annular and angled surface engaging said handle and serving to hold the handle with its holding surfaces away from said stop due to the action of said spring means urging said angled surface against said handle to thereby cause pivoting movement of said inner portion of said handle away from said stop.

4,693,269

CHECK VALVE ASSEMBLY FOR PIPELINE SYSTEM

Yutaka Yamada, Tsushima, Japan, assignor to Yutaka Yamada, Kariya and Nippondenso Co., Ltd., Tsushima, both of, Japan

Continuation of Ser. No. 783,993, Oct. 4, 1985, Pat. No. 4,617,959. This application Jun. 16, 1986, Ser. No. 874,848

The portion of the term of this patent subsequent to Oct. 21, 2003, has been disclaimed.

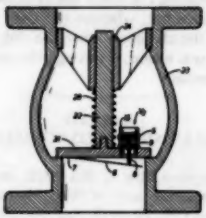
Int. Cl.[4] F16K *15/03*

U.S. Cl. 137—512.1 **3 Claims**

1. A check valve assembly of the quick shutoff type equipped with an auxiliary valve of the slow closure type,

wherein said check valve assembly comprises a valve housing formed therein with a primary cylindrical bore, a primary valve plate arranged within said valve housing to open and close said primary cylindrical bore, and a swingable pressure receiving plate arranged to be applied with a hydraulic pressure at the upstream of said primary valve plate; and

wherein said auxiliary valve comprises a cylindrical valve casing mounted on a portion of said primary valve plate to be located at the downstream of said primary valve plate, said valve casing being formed therein with a secondary cylindrical bore and formed at the peripheral wall thereof with a radial port which is arranged at the downstream of said primary valve plate to permit the flow of hydraulic fluid passing therethrough, a cup-shaped cylinder coupled with one end of said valve casing, a piston slidably disposed within said cup-shaped cylinder to form a chamber in said cylinder, flow restriction means arranged to provide a fluid communication between said chamber and the downstream of said primary valve plate, a valve element slidably disposed within said valve casing to control the quantity of hydraulic fluid flowing through said secondary cylindrical bore and said radial port, and a valve rod arranged to interconnect said piston and said valve element and being engaged at one end thereof with said pressure receiving plate,



wherein the secondary cylindrical bore of said valve casing is in the form of a stepped cylindrical bore having small and large diameter portions, and wherein said valve body is slidably disposed within the large diameter portion of said stepped cylindrical bore and is integrally formed with a semi-spherical projection which is arranged to be coupled within the small diameter portion of said stepped cylindrical bore.

4,693,270

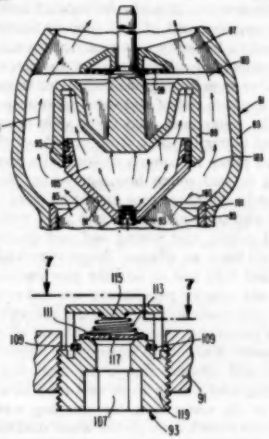
CHECK VALVE

Charles Yaindl, Allentown, Pa., assignor to Durabla Manufacturing Co., Lionville, Pa.

Filed Mar. 24, 1986, Ser. No. 843,308

Int. Cl.[4] F16K *15/02*

U.S. Cl. 137—514.3 **14 Claims**



1. A check valve apparatus, the valve apparatus having an inlet end and an outlet end, comprising:

(a) a disk means and a seat means, the disk means being mounted for movement within a body, the disk means being biased by a spring means to abut the seat means, the disk means, when abutting the seat means, being located near a central member, the disk means being capable of moving away from the seat means in response to fluid flow originating from the inlet end of the valve,

(b) the disk means including chamber defining means, wherein the disk means, when moved away from the seat means, and the central member together form a chamber for fluid,

(c) pilot valve means, disposed at the inlet end of the appara-

tus, the pilot valve means fluidly communicating with the chamber, the pilot valve means allowing substantially unobstructed fluid flow from the inlet end towards the outlet end of the valve apparatus, the pilot valve means including an orifice means, the orifice means being of known size, wherein the orifice means provides a controlled path for fluid flow, out of the chamber, into the inlet end, and out of the valve, when the disk means is moving towards the seat means, and

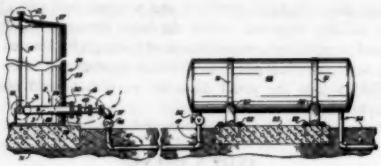
(d) means for sealing the space between the disk means and the central member, wherein the only path for flow of fluid, out of the chamber, when the disk means is moving towards the seat means, is through the orifice means of the pilot valve means.

4,693,271

HORIZONTALLY MOUNTED SUBMERSIBLE PUMP ASSEMBLY

Benjamin F. Hargrove, Rte. 9, Box 192B, and Billy J. Kvaternik, Rte. 6, Box 255½, both of West Monroe, La. 71291

Filed Oct. 21, 1985, Ser. No. 789,321
Int. Cl.[4] F04B *35/04, 41/00*
U.S. Cl. 137—565 **3 Claims**



1. A submersible pump assembly for mounting in a water tank provided with a water distribution system, said submersible pump assembly comprising a cylindrically-shaped stainless steel tube extending into the water tank in horizontal relationship, with one end of said tube located inside the water tank and the opposite end of said tube projecting outside of the water tank; a butterfly valve carried by said one end of said tube for selectively allowing water to enter said tube; an elongated valve stem having one end seated in said butterfly valve and the opposite end of said valve stem projecting through the top of the water tank, said valve stem operable to open and close said butterfly valve from outside of the water tank; an elongated pump housing; a motor and a pumping mechanism enclosed in said pump housing; wiring for energizing said motor; and a discharge pipe extending from said pump housing through said opposite end of said tube, with said pump housing, said motor, said wiring and said discharge pipe located inside said tube; an adaptor flange mounted on said opposite end of said tube and an adaptor pipe carried by said adaptor flange, said adaptor pipe having one end extending inside said tube in communication with said discharge pipe of said submersible pump and the other end of said adaptor pipe attached to the water distribution piping; and nipple means projecting through said adaptor flange for receiving said wiring and channeling said wiring from said tube to a selected location outside of the water tank, for pumping water from said tube and the water tank through the water distribution piping when said butterfly valve is open.

4,693,272

POST PRESSURE COMPENSATED UNITARY HYDRAULIC VALVE

Raud A. Wilke, Brookfield, Wis., assignor to Husco International, Inc., Waukesha, Wis.

Continuation of Ser. No. 579,394, Feb. 13, 1984, abandoned. This application Sep. 5, 1986, Ser. No. 904,798
Int. Cl.[4] F15B *13/08*
U.S. Cl. 137—596 **6 Claims**

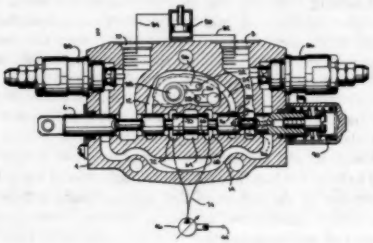
1. A closed center hydraulic control valve assembly comprised of a plurality of control valve sections joined in a bank and for use with a variable displacement pump having output and pressure sensing ports, each of said control valve sections having therein a valve spool movable to an operating position for selectively directing pressure fluid from a supply passage to one of a pair of workports via a feeder passage having upstream and downstream branches with a connecting passage therebetween and with said downstream feeder branch having a U-shaped bridge passage having a pair of legs selectively respectively communicable with said workports by said valve spool, the improvement which comprises:

a check valve biased in one direction toward a position closing said connecting passage and adapted to be moved in the oposite direction to a position opening said connecting passage under force exerted on said check valve in said upstream feeder branch;

metering means on said spool for establishing a predetermined pressure differential across said spool in said operating position;

means for translating workport pressure into force on said check valve and also tending to move said check valve in said closing one direction whereby said check valve can act to hold a load in the absence of pressure in said upstream feeder branch;

means in said housing to communicate workport pressure with said sensing input port of said variable displacment pump having said output port connected with said supply passage, whereby said check valve acts as a pressure compensating valve and moves back and forth to vary the



degree of communication between said feeder branches in response to variations in the forces of opposing fluid pressures acting thereon, to thereby maintain said predetermined pressure differential across said spool and

shuttle means operable to effect subjection of each said check valve to the highest pressure of any said workport in said bank,

said shuttle means comprising a sensing shuttle passage in each said control section between the respective said bridge passage and a shuttle check valve, and a through shuttle passage between said shuttle check valve of its control section and the shuttle check valve of the next control section,

such that if the workport pressure in said bridge passage is greater than the workport pressure in the bridge passage in the previous section, then said shuttle check valve in the present section closes the through shuttle passage of the previous section and opens the sensing shuttle passage of the present section to the through shuttle passage of the present section such that the workport pressure in the bridge passage of the present section is passed through the sensing shuttle passage of the present section to the next section,

and such that if the workport pressure in the bridge passage of the present section is less than the workport pressure in the bridge passage of the previous section, then the shuttle check valve of the present section closes the sensing shut-

tle passage of the present section such that the workport pressure of the previous section flows through the shuttle passage of the previous section and into the through shuttle passage of the present section and into the next section, such that the highest workport pressure is communicated to said pump and to the other side of each of said pressure compensating check valves in said sections.

4,693,273

CONTROL VALVE

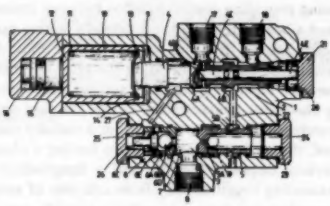
Desmond H. J. Reynolds, and Phillip A. Taft, both of West Midlands, England, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Apr. 1, 1985, Ser. No. 718,444

Claims priority, application United Kingdom, Apr. 4, 1984, 8408635

Int. Cl.[4] F15B *13/06*

U.S. Cl. 137—596.13 **14 Claims**



1. A control valve comprising:

a housing;

an inlet in said housing for pumped fluid under pressure;

a control device;

a first outlet in said housing for connection to a first working circuit;

a second outlet in said housing for connection to a tank;

a spool valve in said housing operable in response to said control device for controlling flow of said pumped fluid to said first and second outlets;

a supply port in said housing for connection to a second working circuit;

a flow control valve for controlling flow of said pumped fluid from said inlet to said supply port in response to the pressure of said pumped fluid;

a first flow channel in said housing for said pumped fluid extending between said flow control valve and said spool valve;

a second flow channel in said housing for pumped fluid extending between said inlet and said spool valve independently of and parallel to said first flow channel; and

a passageway through said flow control valve for communicating said inlet with said first flow channel so that said flow control valve can close said supply port while maintaining pumped fluid flow to said first flow channel for precluding pumped fluid flow to said second working circuit when the pressure of said pumped fluid supplied to said first outlet is less than a predetermined value;

said spool valve being adapted to control the flow of pumped fluid from said second flow channel to said first outlet.

4,693,274

DEVICE FOR THE SELECTIVE INJECTION OF AN OXIDIZING GAS OR A CARRIER GAS WITH OR WITHOUT CARBONACEOUS MATERIAL TO A LIQUID METAL BATH

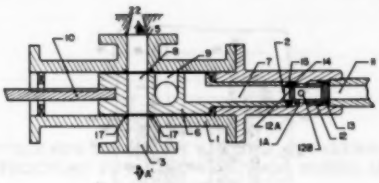
Arturo Lazcano-Navarro; Miguel A. Alcantara, and Jose E. Hernandez-Ruiz, all of Saltillo, Mexico, assignors to Instituto Mexicano De Investigaciones Siderurgicas, Saltillo, Mexico

Continuation-in-part of Ser. No. 642,102, Aug. 20, 1984, abandoned. This application May 14, 1986, Ser. No. 863,001

Claims priority, application Mexico, May 9, 1984, 201284

Int. Cl.[4] F16K *11/00*

U.S. Cl. 137—625.4 **4 Claims**



1. A valve for controlling the selective supply of an oxidizing gas or another gas conveying powdered carbonaceous material to a tuyere for injection of one of such fluids into a liquid metal bath contained in a metallurgical converter vessel; said valve alternatively permitting the entrance of one of said fluids and comprising a casing having a common outlet port and provided with an inner movable cylindrical stem with three internal conduits that depending on said stem position serve for the passage of one of an oxidizing gas from an oxidizing gas casing access port to the common outlet port, the passage of an inert gas from a casing inlet port for said inert gas to the common outlet port, and the passage of a carrier gas with or without carbonaceous material from a casing access port for the carrier gas to the common outlet port for injection; said casing having three inlet ports for alternative entrance of an oxidizing gas, an inert gas, and a carrier gas with or without carbonaceous material, and having one common outlet port to lead the selected fluid to a tuyere for injection;

said carrier gas entry port, and said stem carrier gas internal conduit, and said carrier gas casing common outlet port forming a cylindrical straight flow path for the pneumatic transport of fines within the valve;

said casing inlet ports and stem conduits disposed in such a way that the carrier gas entry port is located far from the oxidizing gas inlet port and having an internal stem conduit with inert gas pressure as a means of separation between the carrier gas flow path and the oxidizing gas flow path;

said casing having an inner wall provided with two circumferential slots on each side of the common outlet port so as to provide pneumatic seal means to the injection fluid and avoid migration of oxidizing gas and carrier gas with carbonaceous powder out of the central injecting flow path;

said housing having one small port to provide pressurized inert gas to an external pressure switch when the carrier gas inlet port is precisely located to connect the casing single outlet port through the carrier gas stem conduit and thus the stem is positioned in the mode of carrier gas injection, and also having another port used to purge said pressure switch when the stem is precisely positioned for the oxidizing gas injection mode;

said cylindricl stem provided with a reduced extension portion disposed axially with respect to said stem with an axial internal conduit to connect the oxidizing gas casing inlet port to the casing single outlet port;

said stem including a reduced extension portion provided with seal means and being able to activate a movable

sealing mechanism located in the oxidizing gas entry port of the casing so as to completely isolate the oxygen line from the rest of the valve when the stem is in carrier gas injection position.

4,693,275

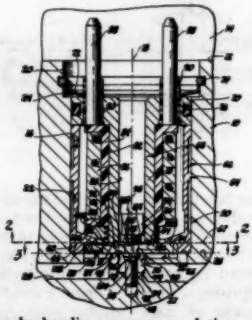
ELECTRO-HYDRAULIC PRESSURE REGULATING VALVE

Donald D. Stoltman, Henrietta, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 28, 1986, Ser. No. 936,636

Int. Cl.[4] F15B *13/044*

U.S. Cl. 137—625.65 **2 Claims**



1. An electro-hydraulic pressure regulating valve comprising:

means defining a valve housing having a main axis,

means defining a control pressure chamber in said valve housing connected to a control pressure port,

means defining an annular supply pressure port in said housing between a source of fluid at a supply pressure and said control pressure chamber aligned on said main axis in a first plane perpendicular to said main axis

and having a first predetermined seat area in said first plane through which pressurized fluid is delivered to said control pressure chamber,

means defining an annular exhaust port between a low pressure fluid sump and said control pressure chamber aligned on said main axis in a second plane parallel to said first plane and having a second predetermined seat area in said second plane through which fluid is exhausted from said control pressure chamber,

a magnetically permeable armature plate having a flat supply sealing surface and a flat exhaust sealing surface,

means mounting said armature plate in said control pressure chamber for movement between a supply seated position wherein said supply sealing surface closes said supply pressure port and said exhaust sealing surface opens said exhaust port and an exhaust seated position wherein said exhaust sealing surface closes said exhaust port and said supply sealing surface opens said supply pressure port,

the differential area of said armature plate exposed to said supply pressure in said supply seated position of said armature plate being equal to substantially only said first predetermined seat area,

spring means between said valve housing and said armature plate biasing said armature plate to said supply seated position,

electric solenoid means in said valve housing operative when selectively energized to create a solenoid EMF for moving said armature plate from said supply seated position to said exhaust seated position, and

means defining a circular cut-out in said armature plate juxtaposed a portion of said valve housing radially inboard of said annular exhaust port in said exhaust seated position of said armature plate operative to limit the differential area of said armature plate exposed to said control pressure in said exhaust seated position of said armature plate to substantially only said second predetermined seat area thereby to minimize the pressure differential resultant force acting on said armature plate toward said exhaust seated position.

4,693,276

PRESSURE-BALANCED SEALS FOR VENTED ACCUMULATORS

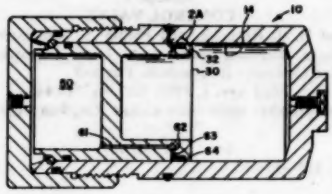
Keith H. Fulmer, Mishawaka, Ind., assignor to Allied Corporation, Morristown, N.J.

Division of Ser. No. 857,901, Apr. 29, 1986, Pat. No. 4,651,782.

This application Sep. 11, 1986, Ser. No. 906,067

Int. Cl.[4] F16L *55/04*

U.S. Cl. 138—31 **5 Claims**



1. A pressure accumulator, comprising a housing having a radial opening providing communication between atmospheric pressure and a bore extending longitudinally within said housing, a piston having first and second piston ends disposed slidably within the bore and dividing the bore into respective first and second chambers, first and second fluids within the respective chambers, characterized in that the first piston end has a circumferential groove disposed at a radially outer portion thereof, the circumferential groove having a plurality of sealing devices disposed therein, and a longitudinal piston opening extending longitudinally from one side of said piston to said circumferential groove in order to provide communication between the second fluid in the second chamber and the sealing devices, the sealing devices comprising a ring exposed to fluid pressure transmitted from the second chamber to the circumferential groove, an annular force-transmitting member having an angled portion engaged by the ring, and seal means disposed in the longitudinal groove and engaging a radially extending side of said force-transmitting member and a surface of the bore, so that the fluid pressure transmitted through the longitudinal piston opening to the ring member biases radially outwardly, relative to the accumulator, the ring against the angled portion and causes longitudinal movement of the force-transmitting member against said seal means to increase sealing effected by the seal means between the first piston end and surface of the bore.

4,693,277

REMOTELY OPERABLE TOOL FOR SETTING PLUGS INTO HEAT EXCHANGER TUBES

Oswald Bieber, Heroldsbach; Erich Haas, Leinburg-Diepersdorf; Rudolf Henglein, Pinzberg, and Bernd Richter, Erlangen, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Jun. 28, 1984, Ser. No. 625,802

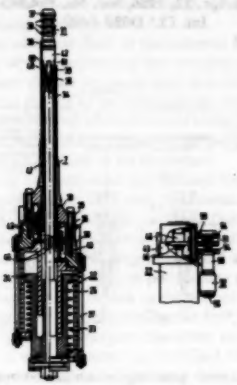
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1983, 3324777

Int. Cl.[4] F16L *55/10*

U.S. Cl. 138—89 **8 Claims**

1. Remotely operable tool assembly, comprising a tool for plugging heat exchanger tubes, said tool including a multi-partite plug including parts being screwed together, a rotatable rod, a rotatable sleeve surrounding said rod, a pressurized medium drive connected to said rod for driving said rod into

one of said parts of said plug and clamping said parts of said plug together, a coupling interconnecting said rod and said



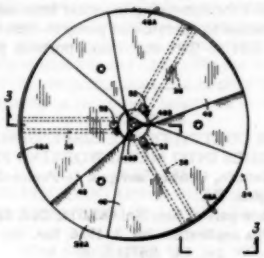
sleeve, and a rotary drive connected to said sleeve for rotating said sleeve.

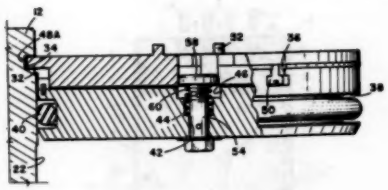
4,693,278

SAFETY CLOSURE MEMBER

Buddy A. Wilson, Sapulpa, and Coy D. Osborn, Tulsa, both of Okla., assignors to T. D. Williamson, Inc., Tulsa, Okla.

Filed Nov. 10, 1986, Ser. No. 928,833
Int. Cl.[4] F16L *55/10*
U.S. Cl. 138—89 9 Claims





1. A closure member for use in a flange having a passageway therethrough communicating with a pressure source, the flange having aninternal circumferential groove, the closure member comprising:

a cylindrical body of external diameter to be slideably received within the flange passageway, the body having a reduced diameter passageway therethrough;

a plurality of leaves slideably supported to said body, each leaf having an outer and an inner end, each leaf being slideable between an outward and an inward position, the outer ends being receivable in said flange groove when the leaves are slideably outwardly extended to the outer position to retain said body in the flange passageway;

means to seal the outer periphery of said body to the flange passageway;

a pressure relief member slideably received in said body passageway having an open and a closed position;

means to prevent said leaves from being moved inwardly when said pressure relief member is in the closed position; and

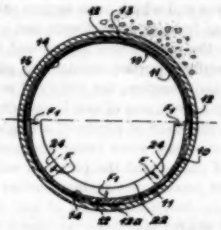
means to move said leaves from the outward to the inward positions and vice versa.

4,693,279

DEVICE FOR REMOVABLY FIXING AN INTERNAL STRUCTURE TO A CIRCULAR WALL INSIDE AN ENVELOPE

Gilles Aubert, Orsay, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 597,667, Apr. 6, 1984, abandoned. This application Feb. 5, 1986, Ser. No. 827,227
Claims priority, application France, Apr. 14, 1983, 83 06110
Int. Cl.[4] F16L *9/18, 57/00*
U.S. Cl. 138—108 3 Claims



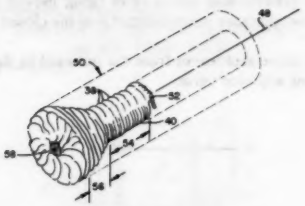
1. A device for fixing an internal structure to an inner wall of an outer cylindrical body, said inner wall having an internal diameter, comprising at least one continuous deformable, resilient annular member constructed of metal having a high yield strength, said body having a fixed length and being provided with a plurality of circumferentially spaced members at each end which extend radially and outwardly of said body, said spaced members being spaced approximately 90° apart each projection terminating in an outer arcuate face conforming to the curvature of the inner wall of said cylindrical body to define an external diameter, the space between the spaced members defining a means for applying an inner radial force to reduce the external diameter, said annular member having a circumferential surface which is completely continuous and uninterrupted throughout the entire circumferential extent thereof, the external diameter of said spaced members exceeding said internal diameter of said inner wall to adapt the device to be placed in a position to fix said annular member to said inner wall, said fixed length of said body causing adjacent spaced members to move radially inward of said body upon application of localized radially outwardly directed force to said body between said adjacent spaced members to reduce said body outer diameter at said adjacent spaced members to a value less than said inner wall internal diameter to permit fixing and removal of said annular member in relation to the inner wall of said cylindrical body.

4,693,280

END CLOSURE FOR SHIRRED CASING STICKS

Robert A. Beardsley, Osceola, Ark., assignor to Viskase Corporation, Chicago, Ill.

Filed Mar. 21, 1986, Ser. No. 842,225
Int. Cl.[4] F16L *11/12*
U.S. Cl. 138—118.1 6 Claims



1. A tubular shirred stick casing article having an inner peripheral surface which defines an axial bore through the article, and an integral end closure disposed within the bore at a fore end thereof, the end closure being composed of casing drawn from the fore end of the shirred stick and formed into a plug within the bore, said plug comprising:

(a) a generally cylindrical body composed throughout its length of accordion-type pleats including a first end portion facing into said bore, an intermediate portion, and a second end portion facing out from said bore;

(b) said first end portion containing pleats which extend across said bore and which press against said inner peripheral surface to form an imperforate and continuous wall transverse to the longitudinal axis of said bore; and

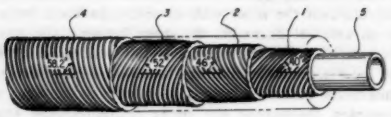
(c) said intermediate portion containing pleats which, in longitudinal cross section, are arranged in two longitudinally extending rows, one of said longitudinally extending rows being composed of pleats of a single ply of casing and the other of said rows being composed of pleats of three plies of casing and the pleats in said rows having proximal ends pressed one against another along a center core about the longitudinal axis of said bore and distal ends pressed against said inner peripheral surface.

4,693,281

VARIABLE MODULUS FILAMENT WOUND PRESSURE TUBE

Richard L. Creedon, San Diego, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed Sep. 23, 1985, Ser. No. 778,696
Int. Cl.[4] F16L *11/08*
U.S. Cl. 138—174 7 Claims



1. A filament wound pressure tube having a longitudinal axis comprising

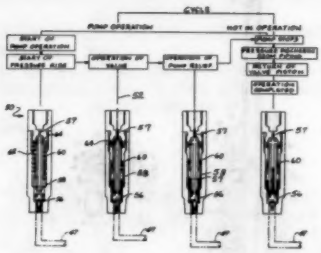
at least two layers of glass filaments wound helically in an epoxy matrix to form said tube wherein the filaments of each such layer are disposed at an angle to a line parallel to the longitudinal axis of said tube which angle is approximately equal to a respective angle θ to said line parallel to said axis, such angle θ being chosen such that the ratio $\sin^2\theta/r$ is approximately the same for all layers, where r is the radial distance from said axis to such layer.

4,693,282

LUBRICATING SYSTEM FOR A WEAVING MACHINE

Leonard Campbell, 209 Park Haywood, Greenville, S.C. 29607

Filed Apr. 22, 1986, Ser. No. 854,845
Int. Cl.[4] D03J *1/00*
U.S. Cl. 139—1 R 7 Claims



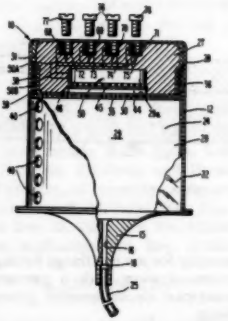
1. A textile fabric weaving machine comprising frame means, means mounted on said frame means for interweaving warp and weft yarns into fabric, comprising, picking instrumentalities which move relative to each other in frictional contact with each other and a gripper projectile for inserting weft yarns into a shed formed by said warp yarns and through a series of projectile guides, and means for lubricating the picking instrumentalities and the gripper projectile comprising a lubricant reservoir, a flow control valve, a pump and piping means for conveying lubricant from said reservoir to said flow control valve under a fluid pressure of between 50 and 300 psi, a lubricant delivery port in at least one of said instrumentalities for lubricating its surface and the surface of other instrumentalities in contact therewith, piping connectign said port to said flow control valve for conveying lubricant from said valve to said ports, and means to operate said pump to deliver drops of lubricant from 0.01 to 0.05 cc to said ports at preselected intervals.

4,693,283

PROCESS FOR CONTINUOUSLY DISPENSING LIQUID MICROBICIDES INTO METALWORKING FLUIDS

Eva E. Talas, Ontario, Canada, assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 683,076, Dec. 19, 1984, abandoned. This application Jul. 2, 1986, Ser. No. 881,376
Int. Cl.[4] B67D *5/00*
U.S. Cl. 141—1 5 Claims



1. Process for dispensing a first fluid into a contained second fluid from a dispensing device capable of continuously dispensing said first fluid therefrom, said dispensing device having an

internal cavity adapted to receive said first fluid and an activatable cell operatively associated with said cavity for generating and supplying gas at a controlled rate to said cavity to dispense said first fluid from said cavity through an associated passageway, comprising the steps of

(a) adding said first fluid to the internal cavity of said dispensing device, activating the gas generating cell of said dispensing device to cause said first fluid added to said dispensing device to be continuously dispensed therefrom while so activated after an initial delay corresponding to the time required for the cell to generate sufficient gas to cause said first fluid to be dispensed;

(b) dropping said activated cell and said first fluid containing dispensing device into said contained second fluid for submergence therewithin, said first fluid being dispensed from said dispensing device while so submerged, said first fluid containing dispensing device and the activated associated cell having a weight per volume sufficient to cause the device and cell to sink in the second fluid and to float on the surface after dispensing the first fluid; and

(c) allowing said submerged dispensing device to rise to the surface of said contained second fluid after said first fluid is dispensed from said dispensing device.

4,693,284

METHOD FOR UNDERGROUND STORAGE TANK ABANDONMENT

Michael D. Dugger, Ladson, S.C., assignor to Petro Fill, Inc., Ladson, S.C.

Filed Jul. 30, 1986, Ser. No. 890,565
Int. Cl.[4] E02D *29/00*
U.S. Cl. 141—1 **12 Claims**

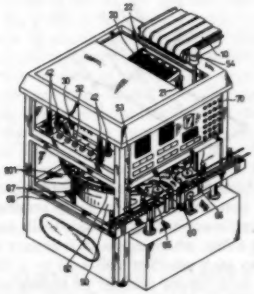
1. A method of abandoning an empty used underground storage tank and rendering the underground tank unusable for the storage of any liquid material, the method comprising the steps of introducing polyurethane foam material into the underground tank and allowing the polyurethane foam material to become rigid whereby the polyurethane foam material substantially completely and tightly fills the underground tank and any of its connecting lines, the method being performed without creating or requiring a large hole in the underground tank.

4,693,285

AUTOMATIC CONTAINER-FILLING APPARATUS

Hong-Tsuan Chang, No. 83, Sec. 2, Ling Sangh Road, Tainan, Taiwan

Filed Sep. 15, 1986, Ser. No. 907,384
Int. Cl.[4] B65B *3/06*
U.S. Cl. 141—71 **18 Claims**



1. An automatic container-filling device for solid foodstuff comprising:

means for feeding said solid foodstuff from the exterior of the automatic container-filling device to the interior of the automatic container-filling device;

means for directing the flow of said solid foodstuff, connected to said solid foodstuff feeding means, including:

an movably mounted inclined channel for transporting said solid foodstuff fed from said solid foodstuff feeding means, including a lower outlet and a flow control valve set disposed on said channel for flow control of said solid foodstuff through said channel;

a collecting basket for collecting said solid foodstuff dropped from said outlet of said channel, including an upper opening disposed below said outlet of said channel and an openable bottom gate at a bottom of said basket;

a load cell functionally connected to said basket for measuring and indicating the weight of said solid foodstuff contained in said basket,

a funnel for collecting said solid foodstuff dropped from said basket through said openable bottom gate, and

a rotating stand for mounting and rotating said funnel;

a first vibrator for vibrating said channel to move said solid foodstuff downward along said channel;

means for transporting containers to beneath said funnel to receive said solid foodstuff dropped from said funnel, and subsequently transporting said containers filled with a predetermined amount of said solid foodstuff out of said automatic container-filling device; and

an automatic control system, including a central processing unit CPU for controlling the action of said flow control valve, said load cell and said openable bottom gate of said basket;

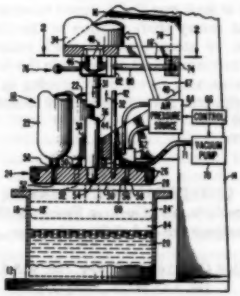
whereby, said channel, said basket and said funnel form collectively a solid foodstuff flow path, and when said solid foodstuff and said containers are fed into said container-filling device, said predetermined amount of said solid foodstuff is filled respectively into each of said containers through said solid foodstuff flow path under the control of said automatic control system, and then said containers filled with said predetermined amount of said solid foodstuff will be transported out of said container-filling device.

4,693,286

FLUID FILLING APPARATUS

Brian E. Lock, Princeton, and Jeffrey S. Wojnar, East Windsor, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 13, 1986, Ser. No. 873,959
Int. Cl.[4] B65B *31/00*
U.S. Cl. 141—61 **8 Claims**



7. Apparatus for airless filling a container comprising:

a base;

a member having a circular cylindrical cavity secured to the base;

a piston movably secured to the base adapted to mate with

and align with said cavity to form a sealed chamber in said cavity when engaged therewith;

means coupled to the base for selectively displacing the aligned piston into and out of engagement with said cavity;

piston stop means having first and second states, said first state engaging said piston for precluding said piston from disengaging from said chamber and a second state for permitting said piston to disengage from said chamber;

means for forcing said piston in one direction against said stop means in said stop means first state;

means for evacuating said chamber while forcing said piston in said one direction;

means for displacing said piston in a second direction opposite the one direction during said second state to reduce the volume of the chamber and force fluid therefrom; and

container means coupled to said chamber for receiving fluid when said piston is displaced in said second direction.

4,693,287

BUNDLE LIMBER

Franz Wroblewski, Granitvägen 8, S-82600 Söderhamn, Sweden

PCT No. PCT/SE85/00432, § 371 Date Jul. 15, 1986, § 102(e) Date Jul. 15, 1986, PCT Pub. No. WO86/02874, PCT Pub. Date May 22, 1986

PCT Filed Nov. 5, 1985, Ser. No. 887,807

Claims priority, application Sweden, Nov. 16, 1984, 8405744

Int. Cl.⁴ A01G *23/02*; B27L *1/00*

U.S. Cl. 144—2 Z **10 Claims**

1. A bundle limber of the type comprising a rotatably mounted drum having infeed and discharge ends at opposite ends thereof, within which a number of processing devices are mounted for mechanically processing a bundle of stems or stem portions with twigs in order to limb and also feed said stems or stem portions longitudinally through the drum, said processing device comprising a rotary shaft which is rotatable about its longitudinal axis and relative to the drum; said rotary shaft including at least one tool adapted to remove, during the rotation of said rotary shaft relative to the drum, the twigs from the stem or stem portions, said rotary shaft being mounted with its longitudinal axis outside the wall of the drum and partially projecting through an opening in the drum wall such that a peripheral portion thereof is located immediately inside the drum wall.

4,693,288

UNIVERSAL JOINT MAKER

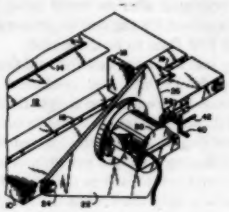
Juergen W. Buechele, and Guenter Fisher, both of LaGrangeville, N.Y., assignors to G & F Precision, Inc., LaGrangeville, N.Y.

Filed Oct. 14, 1986, Ser. No. 918,158

Int. Cl.⁴ B27F *5/00, 1/04*

U.S. Cl. 144—87 **13 Claims**

1. A woodworking tool combination for making interlocking joints in wood parts such as box finger joints and dovetail joints comprising a substantially rectangular body means for attachment to a tool table which includes at least one guide slot in the upper surface thereof for guiding a work feeding means, a work feeding means positioned and arranged for sliding engagement with said guide slot, a router tool, a vertically adjustable tool holder for holding and carrying said router tool with the router cutter axis parallel to said upper surface of said tool table attached to said body means, said body means being attached to a side edge of said tool table parallel to said guide slot, said tool holder being formed substantially in the shape of a sector of a circle and being attached to said body means by a pivotal attachment substantially at the center of the arc of said



sector, said tool holder including a circular arc shaped gear rack at the circular arcuate edge thereof, a pinion gear rotatably attached to said body means and in engagement with said gear rack and including rotating means for vertical adjustment of said tool holder by rotation of said tool holder about said pivotal attachment by rotation of said pinion gear, and means for clamping said circular arcuate edge of said tool holder in a selected vertical position.

4,693,289

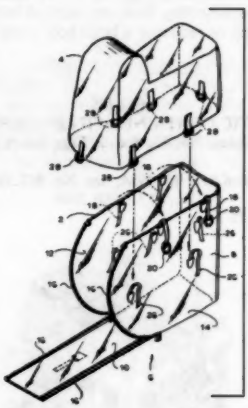
WHEELCHAIR COVER AND METHOD OF USING SAME

Cynthia L. Taylor, and Judith E. M. Nash, both of Orleans, Mass., assignors to Community of Jesus, Inc., Orleans, Mass.

Filed Aug. 23, 1985, Ser. No. 769,160

Int. Cl.⁴ B65D *65/02*

U.S. Cl. 150—52 R **3 Claims**



1. A wheelchair cover comprising a flexible protector enclosure having a bottom section and a top section, the bottom section of the enclosure having four side walls and a floor, one side wall being a flap, which side wall is unitary with the floor and attached to each adjacent side wall by a discrete zipper fastener, with each zipper fastener extending only along the adjacent side walls, so as to allow, when said flap is detached, a wheelchair to be rolled into the bottom section onto the floor of the bottom section and said bottom section being of a size and shape to enclose protectively the lower portion of the wheelchair when said flap is reattached, and the top section of

the enclosure having four side walls and one top wall, which top section is of a size and shape to enclose protectively the upper portion of a wheelchair which has its lower portion enclosed by the bottom section of the enclosure, the upper section of the enclosure contacting the bottom section of the enclosure, thereby forming a protective enclosure for a wheelchair.

4,693,290

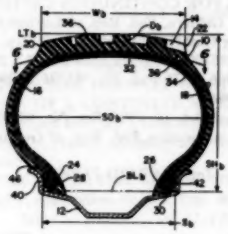
BIAS PLY SNOW TIRE COMPATIBLE WITH RADIAL PLY TIRES

Walter W. Curtiss, Akron, and John E. Lynch, Bedford, Ohio, assignors to The Goodyear & Rubber Company, Akron, Ohio

Continuation of Ser. No. 960,276, Nov. 13, 1978, abandoned, which is a continuation of Ser. No. 773,365, Mar. 1, 1977, abandoned. This application Mar. 7, 1983, Ser. No. 472,907

Int. Cl.⁴ B60C *5/00*

U.S. Cl. 152—450 **10 Claims**



1. In combination, a passsenger vehicle, a pair of radial ply tires in the front wheel positions of said vehicle, a pair of bias ply tires in the rear wheel positions of said vehicle, each of said radial ply tires having an aspect ratio of between 50 and 83, each of said bias ply tires having a circumferentially extending ground engaging tread portion, a pair of sidewall portions, and a pair of bead portions each having an annular inextensible bead core; characterized by each of said bias ply tires comprising a plurality of carcass plies extending circumferentially about the tire and from bead portion to bead portion with the axially outer ends of said carcass plies being turned axially outwardly about the respective bead core and extending radially outwardly therefrom and terminating in the respective sidewall at a distance from the bead base line equal to between 15 and 40 percent of the maximum section height of the tire, the cords of said carcass plies of said bias ply tires form an angle with respect to the mid-circumferential center line of said bias ply tires of between 20 and 35 degrees, an aspect ratio which is at least 5 percent less than the aspect ratio of said radial ply tires, each of said bias ply tires having a non-skid treat pattern, the depth of the non-skid portion of said bias tires is no more than 35 percent greater than the depth of the non-skid portion of said radial tires, the width of the ground-engaging tread portion of each of said bias ply tires is equal to between 50 percent and 80 percent of the maximum section width of said bias ply tires, the point of maximum section width of each of said bias ply tires is located within the radially inner one-half of the cross-section of the tire and each of said radial ply tires in the front wheel positions of the car have a point of maximum section width located in the radially outer one-half of the cross-section of said radial ply tire.

4,693,291

CURTAIN-HOOK ASSEMBLY

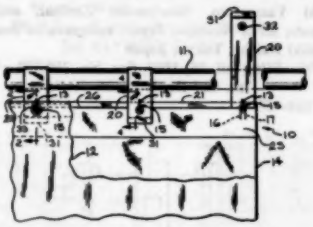
Linda S. Andrews, 3003 W. Lincolnshire, Toledo, Ohio 43606

Filed Jan. 6, 1986, Ser. No. 816,640

Int. Cl.⁴ A47H *15/00, 13/02*

U.S. Cl. 160—388 **3 Claims**

1. An assembly comprising a curtain and a plurality of hooks, each of said hooks having downwardly extending leg which has an upturned free end which constitutes a hook member, said curtain having spaced straps attached at one end to and extending from its upper edge, said hooks being secured to said curtain, one hook in alignment with and adjacent to each strap, said straps having free ends with openings therethrough, and being so sized that the curtain can be installed by



passing said straps over a suitably mounted rod and slipping the openings in the free end of each over one of said hook members, and the hook members of said hooks being so shaped that, when the curtain is so installed, a second curtain can be installed by slipping openings in the vicinity of its upper edge over the hook members.

4,693,292

CASTING OF METAL ARTICLES

John Campbell, Worcester, United Kingdom, assignor to Cosworth Research and Development Limited, Birmingham, Great Britain

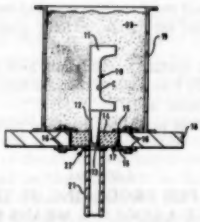
PCT No. PCT/GB85/00235, § 371 Date Jan. 21, 1986, § 102(e) Date Jan. 21, 1986, PCT Pub. No. WO85/05583, PCT Pub. Date Dec. 19, 1985

PCT Filed Jun. 3, 1985, Ser. No. 826,870

Claims priority, application United Kingdom, Jun. 2, 1984, 8414129

Int. Cl.⁴ B22C *9/04, 9/08*; B22D *18/04*

U.S. Cl. 164—34 **14 Claims**



1. A method of precision foundry casting metal articles comprising the steps of supporting an in situ destroyable pattern within a container by means of a feed member, the feed member being mounted within the container, then embedding the pattern in unbonded particulate moulding material and consolidating the moulding material around the pattern to form a mould cavity therein occupied by the pattern, then feeding molten metal through the feed member into the mould cavity by pumping the metal generally upwardly against the force of gravity from a reservoir of molten metal which is at a level which is below the level of the cavity through a passage having one end surrounded by the molten metal and an opposite end which is connected to the mould cavity and an intermediate part which extends through the free surface of the molten metal with a pump formed separately from the reservoir and which draws metal from the reservoir into the pump and discharges metal from the pump into the mould cavity, the pump comprising a part of said passage, then permitting the

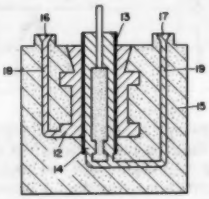
metal to solidify within the cavity and interrupting the feed of said metal and removing the casting from the mould cavity.

4,693,293

METHOD OF CASTING A MACHINE PART BY FUSING METAL LAYERS ON BOTH SIDES OF A SEPARTING PLATE

Harutoshi Yamamoto, Mochizuki; Zenichi, and Sadasue Sakomoto, all of Numazu, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1985, Ser. No. 759,101
Int. Cl.[4] B22D *19/06, 19/16*
U.S. Cl. 164—99 **1 Claim**



1. A method for producing a machine part to be used in a molding machine which is adaped to mold either one of plastic and ceramic materials into molded products having various shapes, comprising the steps of:

preparing a mold provided with a mold cavity therein;

securing a helical-shaped pipe of heating or cooling used to a separating metallic plate;

inserting said separating metallic plate having said helical-shaped pipe secured thereto into said mold for separating said mold cavity into two portions adapted to form a main portion of the machine part and to form a corrosion and wear resistanct portion of the same on both sides of said separating plate;

pouring a metal for forming the main portion and a corrosion and wear resistant metal for forming the corrosion and wear resistant portion, both in melted state, into said mold cavities keeping the levels of said melted metals rising-up in said mold cavities equal to each other, thereby preventing said separating metallic plate from being deformed;

solidifying said metals poured into said mold cavities to metallurgically fuse each of the said metals to the separating metallic plate; and

taking out the thus produced machine part from said mold.

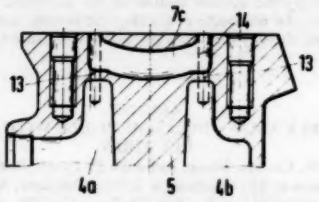
4,693,294

APPARATUS FOR PRODUCING BY THE CASTING TECHNIQUE A COOLING MEANS FOR WEBS BETWEEN ADJACENT CYLINDERS OF A CYLINDER BLOCK AND A CYLINDER BLOCK PRODUCED ACCORDINGLY

Karl-Hans Albrecht, Dillingen; Hartmut Lühr, Saarbrücken-Brebach, and Günter Pieck, Saarbrücken-Fechingen, all of Fed. Rep. of Germany, assignors to Halbergerhutte GmbH, Fed. Rep. of Germany

Filed Mar. 25, 1986, Ser. No. 843,745
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1985, 3512076
Int. Cl.[4] B22D *33/04*
U.S. Cl. 164—312 **7 Claims**

1. An apparatus for producing, by the casting technique, a cooling means for webs between adjacent cylinders cast extremely close together in a cylinder block of a reciprocating engine whose cylinder walls are surrounded on both longitudinal sides and front sides of the cylinder block by a water jacket, with a jacket core to form the water jacket, comprising separate cores disposed in the web (5) to form cooling water channels (7, 7a. 7b) which bridge the two opposite longitudinal sides of said jacket core at the level of the cylinder combustion



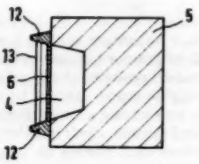
chamber, said separate cores being either fitted at both ends into said jacket core or fixed in an upper bottom core (11).

4,693,295

DEVICE FOR CONTINUOUS CASTING

Siegfried Henders, Geldern, Fed. Rep. of Germany, assignor to Korf Engineering GmbH, Düsseldorf, Fed. Rep. of Germany

PCT No. PCT/DE85/00404, § 371 Date Jun. 17, 1986, § 102(e) Date Jun. 17, 1986, PCT Pub. No. WO86/02298, PCT Pub. Date Apr. 24, 1986
PCT Filed Oct. 16, 1985, Ser. No. 881,031
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1984, 3438482
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—433 **5 Claims**



1. A continuous casting device comprising: a rotatable casting wheel having a circumferential recess which is open radially outwardly for receiving molten material therein which is to harden at least partially therein during rotation of said casting wheel; a band confining said recess radially outwardly of said wheel over at least part of the circumference of the wheel; and a chain passing over said band radially outwardly of said band, said chain having a plurality of individual links; each link having two parallel ribs pressing the band against the circumference of the wheel outside said recess, and also having a bridge connecting said ribs, said bridge being out of contact with said band, whereby pressure is exerted on the band by the chain only outside said recess.

4,693,296

COMPOSITE BREAK RING FOR CONTINUOUS CASTING

Patrick D. King, Rantoul, Ill., assignor to Flo-Con Systems, Inc., Champaign, Ill.

Filed Nov. 7, 1985, Ser. No. 795,837
Int. Cl.[4] B22D *11/10*
U.S. Cl. 164—440 **7 Claims**

1. A break ring for use with a continuous caster comprising, in combination:

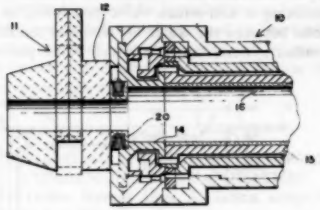
a closed loop body,

said body having an interior first formed U-shaped skin on the inner portion of the loop,

said skin being characterized as a sprayably deposited substance exhibiting the characteristics of a molten metal heat spray deposited outer skin,

a secondary secondly formed U-shaped skin interiorly of the

exterior first formed U-shaped skin formed in intimate contact with the exterior first formed skin and exhibiting the characteristics of a molten metal heat sprayed material different from the material of the exterior skin,



and an interior body portion interior of the second formed U-shaped skin,

said interior body portion being a formable material.

4,693,297

INSTALLATION FOR THE STEP BY STEP VERTICAL EXTRACTION OF A CONTINUOUS CAST PRODUCT

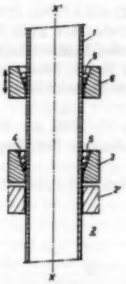
Yves Gourmel, Blenod les Pont a Mousson, and Michel Pierrel, Maidieres, both of France, assignors to Pont A Mousson S.A., Nancy, France

Filed Sep. 18, 1986, Ser. No. 909,053

Claims priority, application France, Sep. 30, 1985, 85 14449

Int. Cl.[4] B22D *11/04, 11/128*

U.S. Cl. 164—447 **3 Claims**



1. Installation for the step by step vertical extraction from an ingot-mould of an elongated solid product (1) obtained by continuous bottom casting, shaping, calibration and solidification in a suitable chamber (2) having an outlet orifice, said installation being characterised by:

a first fixed device (3), situated in the immediate vicinity of the outlet orifice of the chamber, constituted by a ring, surrounding the solid product, having an inner face (4) in the shape of a frustum of a cone having an opening and inner side walls at an angle of between 10° and 20° with respect to the vertical axis of the opening and having its small base towards the bottom, the space situated between the outer surface of the solid product and the inner face of the ring being provided with balls (5) of several diameters able to ensure the wedging of the solid product in the case of the beginning of a movement in the upstream direction of the solid product;

and of a second movable device (6) vertically displaced from the first device and surrounding the solid product and having the same structure as the first device and also comprising balls, the second device having means for carrying out a reciprocating longitudinal movement of the second device along the vertical axis of the second device.

4,693,298

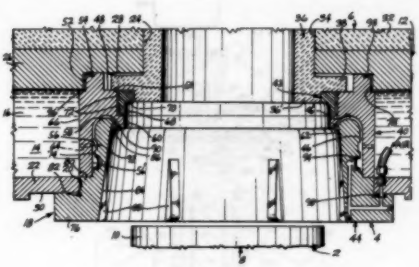
MEANS AND TECHNIQUE FOR CASTING METALS AT A CONTROLLED DIRECT COOLING RATE

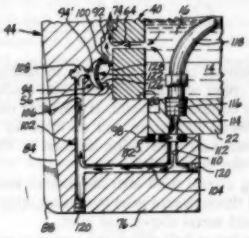
Frank E. Wagstaff, Spokane, Wash., assignor to Wagstaff Engineering, Inc., Seattle, Wash.

Filed Dec. 8, 1986, Ser. No. 939,325

Int. Cl.[4] B22D *11/124*

U.S. Cl. 164—486 **40 Claims**





1. In the process of continuously casting metal as ingot by introducing molten metal to the cavity of an annular mold, through one end opening thereof, and while the metal undergoes partial solidification in the mold to form a body of the same on a support adjacent the other end opening of the cavity, reciprocating the mold and support in relation to one another endwise of the cavity to elongate the body of metal through the latter opening of the cavity, the improvement comprising:

introducing liquid coolant to an annular flow passage which is circumposed about the cavity in the body of the mold and opens into the ambient atmosphere of the mold adjacent the aforesaid opposite end opening thereof to discharge the coolant as a curtain of the same that impinges on the emerging body of metal for direct cooling of the same,

a gas, which is substantially insoluble in the coolant liquid, under pressure into an annular distribution chamber which is disposed about the passage in the body of the mold and opens into the passage through an annular slot disposed upstream from the discharge opening of the passage at the periphery of the coolant flow therein,

releasing the body of gas in the chamber into the passage through the slot,

subdividing the body of gas into a multiplicity of gas jets as the gas discharges through the slot, and

releasing the gas jets into the coolant flow at a temperature and pressure at which the gas is entrained in the flow as a mass of bubbles that tend to remain discrete and undissolved in the coolant as the curtain of the same discharges

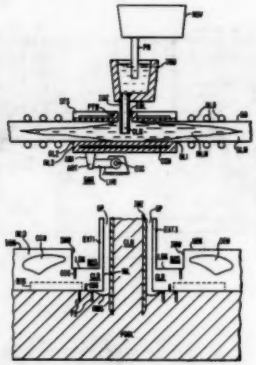
through the opening of the passage and impinges on the emerging body of metal.

4,693,299

CONTINUOUS METAL CASTING APPARATUS

Stephen B. Kuznetsov, Washington, D.C., and Richard D. Nathenson, Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 5, 1986, Ser. No. 871,005
Int. Cl.[4] B22D *11/00, 27/02*
U.S. Cl. 164—502 **11 Claims**



1. Continuous casting apparatus including a casting vessel having an upper wall and a lower wall made of thermally and electrically conductive metal, at least one outlet for extracting solidified metal therefrom and an inlet for admitting molten metal therein said inlet being defined in the upper wall and forming a rim therewith;

a feeding nozzle sunk into the molten metal of said casting vessel through said inlet for maintaining a feeding column of liquid metal above said inlet;

said inlet being defined by an annular portion of said casting vessel;

said nozzle and said annular portion defining a gap therebetween;

means being provided for passing polyphase alternating currents through said annular portion to induce eddy currents in the molten metal adjoining said gap;

a plurality of extensions of the same vessel wall metal being formed vertically at regularly distributed locations on said rim, one such extension being provided for a corresponding phase of said polyphase alternating currents, said alternating current passing means being electrically connected to said plurality of extensions;

whereby electromagnetic forces are generated in the molten metal to prevent escape thereof and to maintain said feeding column.

4,693,300

METHOD AND APPARATUS FOR SPRINKLERLESS SNOW CONTROL

Hideo Adachi, Tokyo, Japan, assignor to Nippon Flute, Co., Iruma, Japan

Filed Aug. 4, 1986, Ser. No. 892,851
Int. Cl.[4] F28D *1/00*
U.S. Cl. 165—1 **19 Claims**

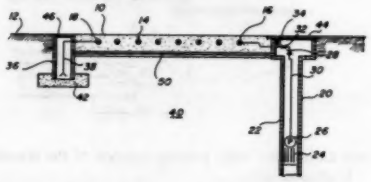
1. A method for minimizing an accumulation of snow upon a roadway, parking lot, roof structure or the like comprising the steps of:

positioning a heat exchange conduit system beneath a surface to be protected from snow accumulation;

pumping relatively warm subsurface water from a lift well beneath the surface of the earth into the heat exchange conduit system to heat the surface and melt snow falling upon the surface;

discharging the subsurface water from the heat exchange conduit system into at least one recharging well for delivery of the water back beneath the surface of the earth;

maintaining a non-return valve positioned at the highest point between the water lift well and the heat exchange conduit system, said non-return valve permitting air to



enter the conduit system upon termination of the subsurface water pumping operation; and

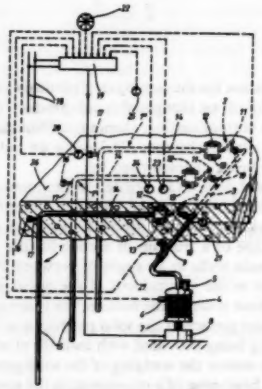
maintaining an air relief conduit between the lift well and the at least one recharging well to equalize air pressure between said said water lift well and said at least one recharging well for preventing a vacuum from forming adjacent said non-return valve which might prevent air from entering the conduit system upon termination of subsurface water pumping operations.

4,693,301

METHOD FOR HEATING A ROAD BY MEANS OF GEOTHERMALLY FED HEATING INSTALLATION AS WELL AS A ROAD-HEATING INSTALLATION FOR CARRYING OUT THE METHOD

Friedrich Baehrle, Kernen-Rommelshausen; Helmut Wulf, Ostfildern, and Helmut Kreeb, Meersburg, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 12, 1986, Ser. No. 906,244
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1985, 3532542
Int. Cl.[4] F24J *3/08*
U.S. Cl. 165—45 **28 Claims**



2. A road heating installation, comprising heat pipe means placed heat conductingly near the road surface, each heat pipe means including a condensation zone extending directly underneath the road surface and an evaporation zone extending to a

depth in the ground for a heat carrier medium disposed within the heat pipe means, sensor means for detecting the determinative factors of the climate, of the road condition and of the heat pipe means, and a control apparatus including control means, the output of the sensor means being fed as inputs to the control apparatus, and said control means being operable to block the heat transfer output of the heat pipe means with a dry-cold by quantity controlled introduction of an inert gas into the condensation zones of heat pipe means and by cancelling the blockage by controlled return of the inert gas out of the condensation zones with changed prerequisites.

4,693,302

HEAT EXCHANGING APPARATUS FOR COOLING AND CONDENSING BY EVAPORATION

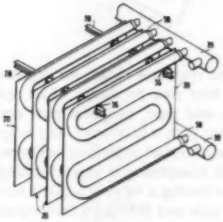
Diego E. F. Dodds, Buenos Aires, Argentina, assignor to Leonard Oboler, Key Biscayne, Fla.

Filed Nov. 14, 1985, Ser. No. 797,734

Claims priority, application Argentina, Dec. 28, 1984, 299141

Int. Cl.[4] F28D *3/02;* **F28F** *3/14, 21/06;* **F28G** *5/00*

U.S. Cl. 165—46 **11 Claims**



1. In a heat exchange apparatus for cooling and condensing by evaporation, said apparatus having first header means for receiving fluid from a source, plastic heat exchange elements defining a plurality of passages through a heat exchange zone and second header means for receiving fluid from said plastic heat exchange elements after passing through said heat exchange zone, means for returning condensed fluid to said source from said second header means and means for flowing a liquid cooling medium in droplet form on the external surfaces of said plastic heat exchange elements, the improvement wherein said plastic heat exchange elements comprises a flexible thin-walled tubular plastic element the operative cross-sectional shape of which is attained when the tube is subjected to predetermined internal pressure, each said flexible thin-walled tubular plastic element being radially expandable by pressure of fluid from said source to avoid scale formation, and one or more rigid horizontal rod means for supporting and rigidifying said flexible thin-walled plastic heat exchange elements.

4,693,303

LIQUID COOLING MODULE WITH SPRINGY CONTACT ELEMENTS AND AN APERTURE PLATE SLIDABLE THEREOVER

Yoshikatsu Okada, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jun. 19, 1986, Ser. No. 876,381

Claims priority, application Japan, Jun. 20, 1985, 60-134842

Int. Cl.[4] F28F *7/00*

U.S. Cl. 165—80.4 **6 Claims**

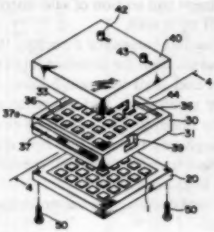
1. A liquid cooling module for heat generating components, comprising:

a substrate on which said heat generating components are mounted;

a thermally conductive member secured to said substrate enclosing said heat generating components, the thermally conductive member having a pair of two-motion coupling means one on each side thereof;

a liquid cooling member having a chamber in which liquid is flowed and a pair of two-motion coupling means respectively engageable with the two-motion coupling means of the thermally conductive member when said thermally conductive member and liquid cooling member are moved toward each other in a first direction and subsequently moved in a second direction with respect to each other normal to said first direction;

an array of thermally conductive, springy contact elements arranged between said thermally conductive member and said liquid cooling member; and



an aperture plate slidable between first and second positions and having an array of apertures corresponding to said contact elements for holding the contact elements in compression when the aperture plate is in said first position to permit said coupling means of said thermally conductive member and liquid cooling member to move in said second direction and allowing said contact elements to partially extend through the corresponding apertures to establish thermal contact between said thermally conductive member and said cooling member when the slidable member is in said second position.

4,693,304

SUBMERGED ROTATING HEAT EXCHANGER-REACTOR

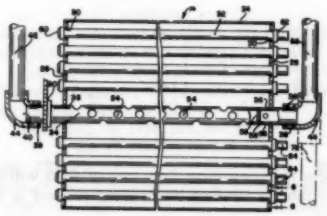
Craig S. Volland, 5615 Kenwood, Kansas City, Mo. 64110

Continuation-in-part of Ser. No. 766,648, Aug. 19, 1985, Pat. No. 4,613,409. This application May 23, 1986, Ser. No. 866,876

The portion of the term of this patent subsequent to Sep. 23, 2003, has been disclaimed.

Int. Cl.[4] F28D *11/08*

U.S. Cl. 165—88 **16 Claims**



1. Apparatus for evaporating a feed liquid, comprising:

(a) an enclosure defining a heat storage section containing a hot liquid;

(b) an evaporator module supported within said enclosure for rotation about a substantially horizontal axis and submerged within said heat storage section thereof, comprising:

(i) an elongated cylindrical housing sealed off by an influent end plate and an effluent end plate;

(ii) a plurality of spaced apart substantially horizontal open ended heat transfer tubes positioned within said housing having influent and effluent end sections thereof respectively extending through said influent end plate and said effluent end plate for passage of hot liquid from said enclosure therethrough;

(iii) a substantially hollow distribution shaft positioned within said housing having end sections thereof respectively extending through said influent end plate and said effluent end plate;

(iv) said distribution shaft having a plurality of spaced apart openings formed therein; and

(v) said effluent end section of said distribution shaft being closed off by a wall;

(c) Influent conduit means for directing the feed liquid into said distribution shaft for distribution of same through said openings in said shaft into said housing;

(d) means for rotation of said evaporator module about a substantially horizontal axis so as to cause the feed liquid to fall through said housing into heat transferring contact with said heat transfer tubes and thereby vaporize a portion of the feed liquid; and

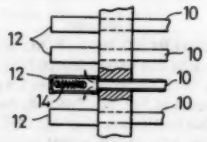
(e) means for withdrawing the vapor formed in said evaporator module.

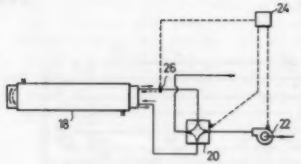
4,693,305

SYSTEM FOR CONTROLLING FLUID FLOW IN A TUBE OF A HEAT EXCHANGER

Masakazu Fujimoto, and Kikuo Kogaito, both of Tokyo, Japan, assignors to Ebara Corporation, Japan

Filed Jan. 18, 1985, Ser. No. 692,850
Int. Cl.[4] F28G *1/02, 1/12*
U.S. Cl. 165—95 **12 Claims**





1. System for controlling flow rate of fluid within a heat exchanger tube, a cleaning brush being situated in the tube, comprising

a circulation system for the fluid through the tube,

switching means coupled into said circulation system for switching direction of the fluid flow through the tube, such that the brush moves through the tube to clean the same, and

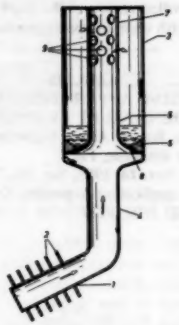
means coupled into said circulation system for increasing flow rate of the fluid through the tube prior to or during actuation of said switching means.

4,693,306

REGULATOR MEANS FOR USE IN HEAT PIPES

Hans-Ove Nilson, Kallered, Sweden, assignor to AB Volvo, Gothenborg, Sweden

Filed Feb. 27, 1986, Ser. No. 834,211
Claims priority, application Sweden, Mar. 4, 1985, 8501033
Int. Cl.[4] F28D *15/00*
U.S. Cl. 165—104.21 **2 Claims**



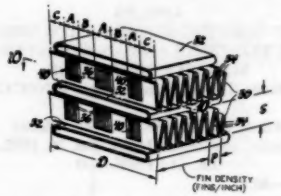
1. An improved regulator means for regulating the transfer of heat inside a heat pipe by means of an operative medium contained inside said pipe, said heat pipe comprising a heat emitting condenser part, a heat-absorbing evaporator part and an interconnecting conduit extending between said two parts, the improvement comprising a valve forming said regulator means, said valve having a valve seat fixed relative to an inner face of said heat pipe and defining a flow opening, and a valve body which is disposed inside said heat pipe and formed from a material having a different coefficient of thermal expansion than the heat pipe material, a first part of said valve body being fixedly secured to said heat pipe at a point spaced from said valve seal and a second part of said valve body being juxtaposed to said valve seat and defining therewith an opening gap of varying area inside said valve in dependence of the degree of heating of said heat pipe.

4,693,307

TUBE AND FIN HEAT EXCHANGER WITH HYBRID HEAT TRANSFER FIN ARRANGEMENT

Louis Scarselletta, Lockport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 776,419, Sep. 16, 1985, abandoned, which is a continuation of Ser. No. 642,100, Aug. 20, 1984, abandoned. This application Sep. 29, 1986, Ser. No. 912,575
Int. Cl.[4] F28D *1/02*
U.S. Cl. 165—152 **3 Claims**



3. A tube and fin heat exchanger comprising a plurality of flat tubes arranged in spaced side-by-side relationship, a folded strip forming a plurality of louvered fins arranged in spaced side-by-side relationship and between and in heat transfer relationship with adjacent ones of said tubes, said fins having a

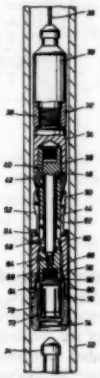
thickness and stacked density such as to constitute not more than about 12% nor less than about 2.5% of the space between the adjacent tubes, said fins further having a total louvered area not more than about 60% nor less than about 40% of the total fin area, said fins having a length along their air flow facing edge per unit of area between the tubes divided by said unit area that as measured in millimeters is not more than about 1.2 mm^{-1} nor less than about 0.68 mm^{-1}, and said fins further having at least one strengthening beam of reverse bent cross-sectional configuration formed integral therewith and extending thereacross between the adjacent flat tubes for strengthening the fins against crushing from external forces and the flat tubes against ballooning from internal forces.

4,693,308

TUBING CONVEYED PERFORATING SAFETY ANCHOR

Robert R. Luke, Houston, and James M. Barker, Katy, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Dec. 19, 1985, Ser. No. 810,635
Int. Cl.[4] E21B *31/18*
U.S. Cl. 166—55.1 **16 Claims**



1. In a tubing conveyed perforating gun assembly supported at the lower end of a tubing string and adapted to be fired by a dropped weight bar with fishing neck falling through the tubing string, subject to sticking before initiating detonation of the charges in the tubing conveyed perforating gun assembly, a safety anchor comprising:

(a) an elongate body having connecting means for connection with a supportive wireline enabling said elongate body to be lowered in the tubing string;

(b) fishing neck grapple means supported at the lower end of said elongate body for engaging the fishing neck on the weight bar stuck in the tubing string;

(c) means disconnecting said wireline from said body at said connecting means;

(d) radially expandable slip means on said body and adapted to engage the wall of the tubing string connected to the tubing conveyed perforating gun assembly to secure said body at a specified location along the tubing string to prevent further movement there along during retrieval of the tubing string from the well while supporting the stuck weight bar therebelow;

(e) wherein said body includes:

(1) a central mandrel;

(2) an elongate sleeve telescoped around said mandrel for sliding axial movement;

(3) a set of encircling collet fingers comprising said grapple means;

(4) a surrounding grapple cage about said collet fingers sized to clamp said fingers radially inwardly to clamp the fishing neck; and

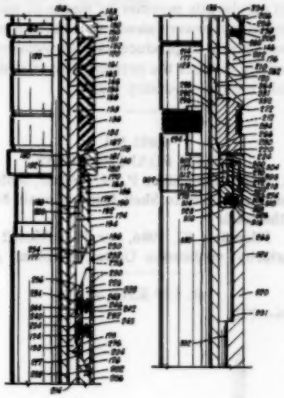
(5) means connected to said grapple cage for relatively positioning said grapple cage to enable movement to a locking position relative to said collet fingers.

4,693,309

WIRELINE SET/TUBING RETRIEVABLE BRIDGE PLUG

Kenneth D. Caskey, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 750,557, Jun. 27, 1985, Pat. No. 4,648,446. This application Feb. 19, 1986, Ser. No. 831,249
The portion of the term of this patent subsequent to Mar. 10, 2004, has been disclaimed.
Int. Cl.[4] E21B *23/06*
U.S. Cl. 166—123 **20 Claims**



1. A retrievable downhole tool for use in a well bore, said tool comprising:

mandrel means having a shaped recess thereon;

packer mandrel means disposed around said mandrel means and comprising first ratchet means thereon;

ratchet body means disposed around said packer mandrel means and comprising second ratchet means thereon for releasably engaging said first ratchet means;

mandrel case means disposed around said mandrel means and having lug means thereon for engaging said shaped recess in said mandrel means;

packer means on said packer mandrel means for releasably, sealingly engaging said well bore; and

slip means for releasably, grippingly engaging said well bore.

4,693,310

CONFORMANCE CORRECTION TO IMPROVE HYDROCARBON RECOVERY FROM A SUBTERRANEAN FORMATION

David L. Gibbons, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Dec. 10, 1986, Ser. No. 939,985
Int. Cl.[4] E21B *33/138*
U.S. Cl. 166—270 **28 Claims**

1. A process for substantially reducing the permeability of at least one relatively high permeability region bounded by a relatively low permeability region in a hydrocarbon bearing formation below an earthen surface penetrated by a well bore in fluid communication with said at least one relatively high permeability region, the process comprising the steps of:

(a) adding a monovalent salt, which does not substantially crosslink an acrylamide polymer, to an aqueous acrylamide polymer solution in an amount sufficient to render the viscosity of said polymer solution, when crosslinked by a crosslinking system to form a crosslinked gel, less sensitive

to the concentrations of said polymer and crosslinking system in said gel;

(b) sequentially injecting said salt-containing polymer solution and a crosslinking system solution, comprising a compound of a polyvalent metal ion and a reducing compound, into said at least one relatively high permeability region via said well bore;

(c) mixing said salt-containing polymer solution and crosslinking system solution in situ to form a gelation solution; and

(d) gelling said gelation solution in said at least one relatively high permeability region by reducing said polyvalent metal ion from a higher valence state to a lower valence state by means of said reducing compound and crosslinking said acrylamide polymer by means of said polyvalent metal ion at said lower valence state in the presence of said monovalent salt to produce said crosslinked gel which substantially reduces the permeability of said at least one relatively high permeability region.

4,693,311

STEAM FOAM PROCESS

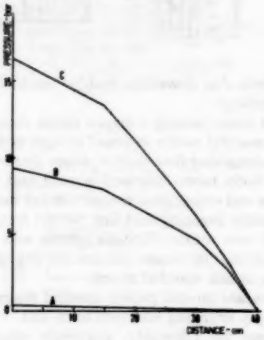
Herman M. Muijs, and Paulus P. M. Keijzer, both of Rijswijk, Netherlands, assignors to Shell Internationale Maatschappij, B.V., Netherlands

Filed Jun. 17, 1986, Ser. No. 875,412

Claims priority, application United Kingdom, Jul. 4, 1985, 8516920

Int. Cl.[4] E21B *43/24*

U.S. Cl. 166—272 **12 Claims**



1. In a process for displacing oil within an oil-containing subterranean reservoir containing a relatively steam-permeable zone by flowing a steam-containing fluid in conjunction with a surfactant component through the relatively steam-permeable zone within said reservoir, the improvement wherein the surfactant component employed comprises in substantial part at light one linear C_{25}–C_{30}-α-olefin sulphonate.

4,693,312

METHOD OF UTILIZING PARAFFIN INHIBITORS

Gary L. Lenderman, Richmond, Tex., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Oct. 3, 1986, Ser. No. 915,196

Int. Cl.[4] E21B *37/06*

U.S. Cl. 166—279 **2 Claims**

1. An improved method for depositing a polymeric pour point depressant in an oil producing formation so that the polymeric pour point depressant can slowly dissolve in the oil as the oil is produced which comprises the steps of:

A. Adding an activator for the polymeric pour point depressant into the formation, and then;

B. Injecting a dispersion of the polymeric pour point depressant into the activator treated formation.

4,693,313

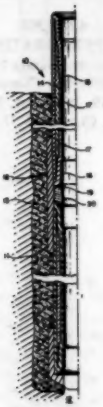
INSULATED WELLBORE CASING

Edgar O. Stephenson, Pierce County, and Raymond C. Howe, King County, both of Wash., assignors to Kawasaki Thermal Systems, Inc., Tacoma, Wash.

Filed Jun. 26, 1986, Ser. No. 878,996

Int. Cl.[4] E21B *36/00, 43/24*

U.S. Cl. 166—302 **8 Claims**



1. An insulated wellbore casing adapted to be cemented to the surrounding earth of a wellbore, comprising:

an outer tubular member adapted to be cemented to the surrounding earth of the wellbore;

an inner tubular member, concentrically spaced from said outer tubular member, having terminal ends substantially adjacent said outer tubular member and providing an insulating annular cavity therebetween;

insulation material filling said annular cavity between said inner and outer tubulars; and

weldments that join said outer and inner tubular members with said insulation held therebetween, said weldments joined while said inner tubular member is tensioned, whereby an integrated casing unit is formed that is prestressed to accommodate linear thermal expansion of said inner tubular member at well-operating temperatures.

4,693,314

LOW ACTUATION PRESSURE BAR VENT

David S. Wesson, Katy, Tex.; Stanley J. Wall, Oxnard, and John H. Hales, Ventura, both of Calif., assignors to Halliburton Company, Duncan, Okla.

Filed Feb. 18, 1986, Ser. No. 831,237

Int. Cl.[4] E21B *34/06*

U.S. Cl. 166—317 **15 Claims**

1. A tubing vent comprising:

body means, defining a central opening therethrough, attachable to a tool string and having port means thereon for providing a communication between a well annulus and said central opening;

piston means reciprocably disposed in said body means central opening and having a closed position covering said port means and an open position;

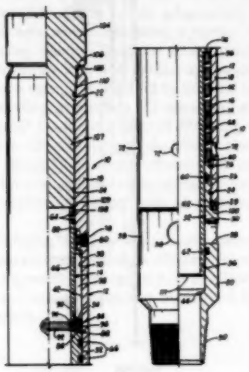
biasing means for biasing said piston means toward said open piston;

balancing means for balancing said biasing means and for

maintaining said piston in said closed position, said balancing means comprising:

fluid reservoir means between said body means and piston means; and

a volume of fluid disposed in said fluid reservoir means, and sealingly enclosed therby for preventing movement of said piston means from said closed position;



location means for locating and maintaining said piston means in said closed position such that at least a portion of said fluid may be added to said fluid reservoir means, said location means being removable prior to attaching said body means to said tubing string;

and

releasing means for releasing said balancing means and for allowing said biasing means to move said piston means from said closed position to said open position.

4,693,315

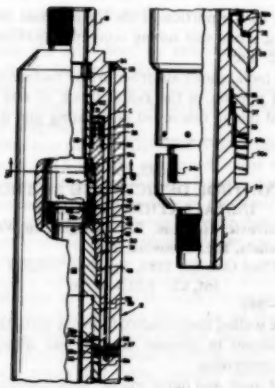
BLEEDOFF TOOL FOR WELL TEST SYSTEM

Frank H. Taylor, Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 764,391, Aug. 12, 1985, Pat. No. 4,640,363. This application Sep. 8, 1986, Ser. No. 904,694

Int. Cl.[4] E21B *34/04*

U.S. Cl. 166—336 **10 Claims**



1. A safety system for testing underwater wells comprising:

(a) a riser on a blowout preventer spaced above a landing shoulder in the well casing; and

(b) a string of test pipe in the well casing and riser including

a retainer valve spaced above a bleedoff tool having

a piston,

a body rotatably mounted and sealed around said piston and

closed flow passage means therein, said passage means openable by relative rotation between

said piston and body to permit flow between the inside of said bleedoff tool and said riser,

said bleedoff tool spaced above a subsea test tree having an upper latch section releasably connectable to a lower body and said subsea test tree spaced above a hanger near the upper end of said string.

4,693,316

ROUND MANDREL SLIP JOINT

Paul D. Ringgenberg; Daniel A. Newman, and Harold K. Beck, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Nov. 20, 1985, Ser. No. 800,172

Int. Cl.[4] E21B *17/07*

U.S. Cl. 166—355 **12 Claims**

1. A slip joint for use in a well string, said slip joint comprising:

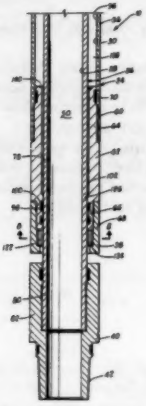
first mandrel means defining a central opening longitudinally therethrough;

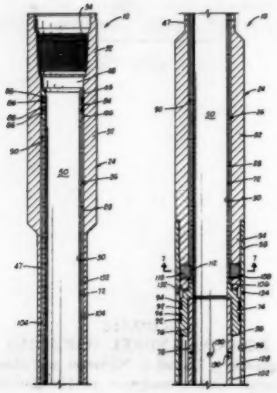
second mandrel means defining a central opening therethrough and having a portion reciprocably positioned in said central opening of said first mandrel means such that said second mandrel means central opening and a portion of said first mandrel means central opening define a variable volume internal chamber;

key receiving means defined on both said first and second mandrel means, said key receiving means comprising in part a surface of one of said first and second mandrel means defining a longitudinal slot therealong and in part key engaging means on the other of said first and second mandrel means and adjacent said slot defined on said one of said first and second mandrel means; and

key means engageable with said key receiving means for transmitting torque between said first and second mandrel means and providing guidance during relative movement thereof, said key means being separable from said first and

second mandrel means, and comprising a substantially annular ring portion engaged with said key engaging





means and rotatable therewith and a lug portion extending radially from said ring portion and into said slot.

4,693,317

METHOD AND APPARATUS FOR ABSORBING SHOCK

A. Glen Edwards, Hockley; David S. Wesson, Katy, both of Tex., and Emmet F. Brieger, Nogal, N. Mex., assignors to Halliburton Company, Duncan, Okla.

Filed Jun. 3, 1985, Ser. No. 740,927

Int. Cl.[4] E21B *17/07, 43/11*

U.S. Cl. 166—378 **16 Claims**

7. A tubing conveyed perforating gun tool string assembly for use in an earth borehole, comprising:

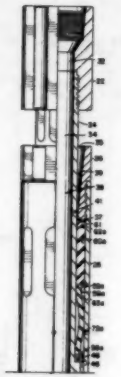
a shock sensitive component coupled to said tool string which is to be isolated from a portion of the shock to said asembly;

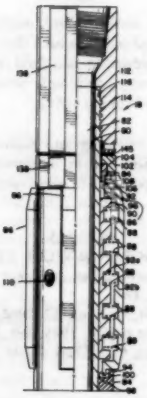
a tubing conveyed perforating gun coupled to said tool string; and

means for damping a portion of the longitudinal and radial accelerations of said shock sensitive component due to the detonation of said tubing conveyed perforating gun.

11. A method of minimizing the transfer of shock caused by the detonation of a tubing conveyed perforating gun to other components in a tool string, said tubing conveyed perforating gun being releasably connected to said tool string, said tool string extending through a portion of a well bore, said method comprising the steps of:

mounting a longitudinal shock absorber in said tool string on a first side of said tubing conveyed perforating gun to





absorb at least a portion of the longitudinal shock to said tool string when said tubing conveyed perforating gun is detonated; and

mounting a radial shock absorber in said tool string to absorb at least a portion of the radial shock to said tool string when said tubing conveyed perforating gun is denotated.

4,693,318

SAND CONTROL DEVICES AND METHOD OF INSTALLATION THEREOF

Ljubisa M. Petrovic, Houston, Tex., assignor to Well Improvement Specialists, Inc., Houston, Tex.

Filed Oct. 10, 1985, Ser. No. 786,050

Int. Cl.[4] E21B *43/08*

U.S. Cl. 166—380 **22 Claims**

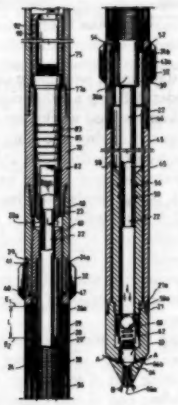
1. A double walled sand control filter for installation in fluid bearing formations to prevent sanding and silting in during production, comprising:

(a) a pair of inner and outer spaced, substantially concentric screen members positioned to define an annular filter spaced therebetween adapted to contain a filtrating me-

dium for filtering sand and particulate materials having tendency to pass into a well, said filtrating medium tending to be subjected to compaction during production of formation fluids;

(b) means for connecting said inner and outer screens together so that the openings within the outer screen extend to a maximum elevational position E1 higher than the maximum elevational position E2 of the openings in the inner screen, said openings formed on the inner screen extending elevationally to cover substantially the entire length of said inner screen excepting a portion of the inner screen extending upward from the inner screen openings being an imperforate side wall extending coextensive with the outer screen openings from E1 to E2, said inner screen openings extending to position E2 remaining substantially entirely covered by the compacted filtrating medium so that formation fluid entering the filter always passes through the filtrating medium substantially entirely in a horizontal direction without an appreciable velocity component in a vertical direction prior to entering the inner screen; and

(c) means for defining a sedimentation area below the filter into which particulate materials filtered from formation fluid with the annular filter space pass to allow the filtrating medium to remain essentially unclogged by said particulate materials.



8. A method for installing a sand control filter within an existing well bore formed within a fluid bearing formation, comprising the steps of:

(a) cleaning the well bore by removing sand tending to collect in the bottom of the well;

(b) placing a wash down media into the bottom of the well, said wash down media substantially consisting of loose glass or polymer spheres;

(c) installing into the well the sand control filter carrying a wash pipe and a jet shoe connected below the filter, said sand control filter being lowered into the well until the jet shoe contacts the upper surface of the wash down media, said sand control filter having an outer diameter less than the inner diameter of the well to define an annular space therebetween; and

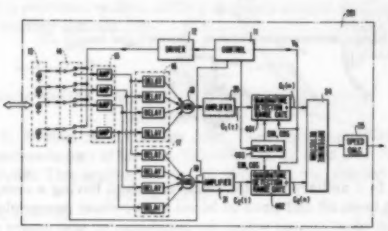
(d) injecting a working fluid in sufficient quantities through the wash pipe for ejection through the jet shoe to displace the wash down media and allow the jet shoe to settle to the well bottom, said sand control filter thereby settling into a common elevational position with fluid bearing formation zones and being entirely surrounded by the wash down media entering the annular space by the action of forceable displacement of the media by ejection of working fluid from the jet shoe, said wash down media tending to prevent abrasion of the sand control filter tending to be caused during initial production of formation fluid as said formation fluid initially enters the sand control filter through the annular space from the surrounding formation carrying abrasive formation sand with it, said wash down media thereby trapping between open spaces formed between adjacent spheres the large particles of sand and particulate material flowing from the formation fluid, said spheres of the wash down media having a low coefficient of friction with the sand control filter to allow for easy installation and removal of the filter for servicing without destroying the filter.

4,693,319

CORRELATION DETECTION TYPE ULTRASOUND BLOOD FLOWMETER

Shinichi Amemiya, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 2, 1985, Ser. No. 782,921
Claims priority, application Japan, Oct. 8, 1984, 59-210800
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—663 **8 Claims**



1. A correlation detection type ultrasound blood flowmeter for measuring speed of flowing blood in a body, comprising:

first means for repeatedly sending burst ultrasound waves toward two sample volumes, through which said blood is flowing, with a repetition frequency and for receiving echo signals along two lines from the body including echo signals from said flowing blood and fixed substances in the body, said two sample volumes being respectively positioned at the same distance from said blood flowmeter,

sine-cosine generator means for providing a sine signal and a cosine signal;

quadrature means for selecting respective ones of said echo signals, corresponding to said echo signals from said flowing blood passing through said two sample volumes, by eliminating said echo signals reflected by said fixed substances, said quadrature means including

multiplier means for multiplying said echo signals by said sine signal, for multiplying said echo signals by said cosine signal, and for providing output signals varying in response to said multiplications;

low pass filter means for filtering high frequency components of said output signals of said multiplier means and for providing the low pass filtered signals as filtered echo signals;

range gate means for extending a range of each of said two sample volumes by sampling and averaging said filtered echo signals in accordance with a gate pulse and for providing an output responsive to said sampling and averaging;

high pass filter means for filtering low frequency components out of said output of said range gate means and for providing the high pass filtered signals as filtered range signals;

squaring circuit means for squaring said filtered range signals; and

adding means for adding said squared filtered range sig-

nals and for providing added outputs responsive to said adding;

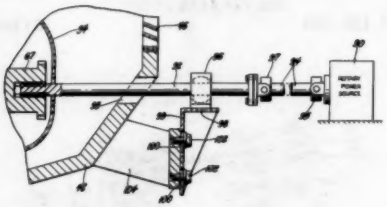
cross-correlation time difference detection means for cross-correlating said added outputs and for providing, based upon said cross-correlation, an output varying in accordance with the speed of said flowing blood in a direction substantially perpendicular to a line midway between said two lines.

4,693,320

FIRE SUPPRESSION TEST APPARATUS

Paul J. Lescoe, Riverview, and Charles E. Scheffler, St. Clair Shores, both of Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 7, 1986, Ser. No. 895,007
Int. Cl.[4] A62C *37/22*
U.S. Cl. 169—61 5 Claims



1. In a military tank that includes a hull having a compartment in its aft end sized to house a propulsion power plant; a power plant located within the compartment; said power plant comprising an internal combustion engine occupying the forward portion of the compartment, and a transmission occupying the rearward portion of the compartment; said engine being an air-cooled engine wherein fan means moves compartment air across the engine cylinders and through exhaust openings in a hull wall; said transmission having gear means therein normally operable to drive the fan means when the engine is running; and fire suppression means within the hull, said fire suppression means comprising fire detection means within the compartment, liquid fire suppressant spray means within the compartment, and liquid fire suppressant supply means within the hull forwardly from the power plant compartment, said supply means being electrically connected with the detection means whereby fire suppressant is delivered to the spray means when the detection means senses a fire condition in the compartment:

the improvement comprising an add-on means for running the fan means without running the engine, whereby the fire suppression means can be tested with coolant air flowing through the compartment even though the engine is inoperable; said add-on means comprising a first horizontal shaft extending through the rear wall of the hull into the power plant compartment, an external power source, a second shaft interconnecting the power source and first shaft, a first universal joint between the two shafts, and a second universal joint between the power source and the second shaft.

4,693,321

METHOD USING ENCAPSULATED FLOW IMPROVERS TO REDUCE TURBULENCE

D. Jack Royer, Ponca City, Okla., assignor to Conoco Inc., Wilmington, Del.

Filed Nov. 18, 1985, Ser. No. 799,070
Int. Cl.[4] F17D *1/16*
U.S. Cl. 137—13 9 Claims

1. A method for using non-crystalline hydrocarbon soluble polymeric flow improvers capable of reducing turbulence in hydrocarbons flowing through conduits, comprising

(a) encapsulating said flow improver to form free-flowing particles, consisting essentially of normally noncrystalline, hydrocarbon soluble polymers having a molecular weight above 1×10^6

(b) placing said encapsulated flow improver in contact with the hydrocarbon, then

(c) placing the flow improver into intimate

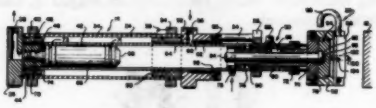
contact with said hydrocarbon by mechanical fracturing, melting, leaching or dissolution of the encapsulating material.

4,693,322

PNEUMATIC HAMMER

Roger H. Gartside, Glenshaw, Pa., assignor to The Pannier Corporation, Pittsburgh, Pa.

Filed Oct. 10, 1985, Ser. No. 786,030
Int. Cl.[4] B23B *45/16*
U.S. Cl. 173—116 7 Claims



1. Apparatus for stamping a workpiece comprising:

a pneumatic cylinder defining a cylindrical chamber having a leading end closest to said workpiece and a trailing end;

a cylindrical piston rod having a leading end and a trailing end disposed coaxially within said cylindrical chamber and having a piston secured to the trailing end thereof, said piston rod being displacable between a retracted position in which the trailing end of said piston rod is adjacent said trailing end of said cylindrical chamber and an extending position in which the trailing end of said piston rod is remote from said trailing end of said cylindrical chamber, the inner surface of said piston rod defining a cylindrical barrel;

means for applying fluid under pressure to said chamber either to the area between said trailing end of said chamber and said trailing end of said piston rod or to the area between the leading end of said chamber and the leading end of said piston rod and for releasing the fluid pressure in such areas;

an impact piston slidably disposed within and of similar cross-sectional shape to said barrel, said impact piston having a leading end and a trailing end;

means for applying fluid under pressure either to the area between the trailing end of said barrel and the trailing end of said impact piston or to the area between the leading end of said barrel and the leading end of said impact piston and for releasing the fluid pressure in such areas so as to, respectively, either propel said impact piston between a position at the trailing end of said barrel and a position at the leading end of said barrel or to move said impact piston between said position at the leading end of said barrel to said position at said trailing end of said barrel;

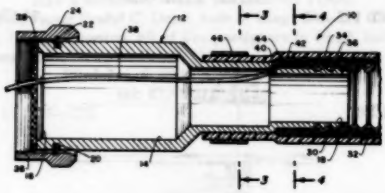
a stamp means movably supported by the leading end of said piston rod and having a stamping face and also having a portion disposed within said barrel whereby when said piston rod is in its extended position said stamping face is disposed adjacent to said workpiece and such that when said impact piston is propelled to the position at the leading end of the barrel it is caused to contact said portion of said stamp means, said contact being effective to cause said stamping face to indentingly contact said workpiece.

4,693,323

FLEXIBLE ELECTROMAGNETIC PULSE SHIELDING CONDUIT

Max T. Owensby, 8116 Deering Ave., Canoga Park, Calif. 91304

Filed Feb. 18, 1986, Ser. No. 830,201
Int. Cl.[4] H05K *9/00*; H02G *3/04*; F16L *33/20*
U.S. Cl. 174—35 C **3 Claims**



3. A flexible electromagnetic pulse shielding conduit for electrical conductors comprising:

a backshell having an internal open-ended chamber, said backshell having an inner end and an outer end, said outer end being adapted to connect with a separate electrical apparatus, said inner end having an exterior screw-threaded portion;

a thin-walled conduit, said conduit being flexible, said conduit including a series of convolutions, said convolutions of an end of said conduit screw threadingly connecting with said screw-threaded portion of said inner end;

an electrically conductive metallic tube assembly concentrically disposed about said conduit, one end of said tube assembly being in direct contact with said backshell;

a first metallic band located about said one end, said first metallic band being shrunk about said one end and thereby tightly binding said one end to said backshell forming a secure connection therebetween;

a rubber sleeve disposed about said electrically conductive metallic tube assembly, a second metallic band located about said rubber sleeve, said second metallic band being shrunk about said rubber sleeve and thereby tightly binding said rubber sleeve to said backshell forming a secure, moisture proof seal therebetween; and

said second metallic band being longitudinally spaced from said first metallic band, said second metallic band being located nearer said outer end than said first metallic band, whereby said rubber sleeve completely encloses said tube assembly and said first metallic band.

4,693,324

CURRENT-CARRYING FLEXIBLE HOSE

Alcide W. Choiniere, and George T. Dunn, Jr., both of Abbeville, S.C., assignors to Automation Industries, Inc., Darien, Conn.

Filed Aug. 1, 1986, Ser. No. 891,900
Int. Cl.[4] A47L *9/24*; F16L *11/11*
U.S. Cl. 174—47 **11 Claims**

1. A current-carrying flexible hose comprising:

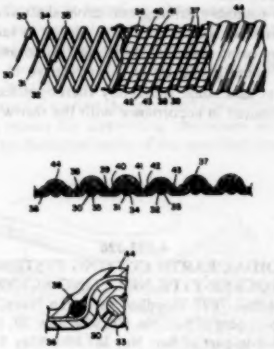
(a) first and second parallel helical support members disposed in double lead fashion with successive convolutions alternating;

(b) an inner plastic strip wrapped helically about said support members with forward and rearward edge portions of said inner plastic strip overlapping convolutions of the second of said support members;

(c) an outer plastic strip wrapped helically about said inner plastic strip with forward and rearward edge portions of said outer plastic strip overlapping convolutions of the first of said support members; and

(d) at least one pair of helical electrical conductors disposed on opposite sides of one of said support members and slidably positioned between said inner and outer plastic strips, each of said helical electrical conductors comprising:

(i) a conductive elements; and



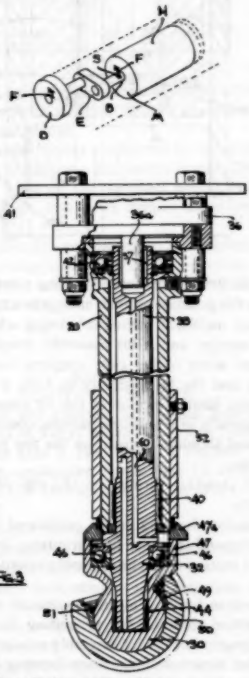
(ii) a dielectric plastic coating disposed around said conductive element.

4,693,325

SONIC DRILL EMPLOYING ORBITING CRANK MECHANISM

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 90503

Continuation-in-part of Ser. No. 725,648, Apr. 22, 1985, Pat. No. 4,615,400. This application Apr. 7, 1986, Ser. No. 848,945
Int. Cl.[4] E21B *7/24*
U.S. Cl. 175—55 **7 Claims**



1. A sonic drilling device comprising:

a housing having inertia;

a drive shaft mounted for rotation in said housing and having

an eccentric portion on one end thereof forming an effective crank arm;

a drill bit supported for universal motion on the end of said crank arm; and

means for rotatably driving said drive shaft at a speed such as to generate sonic vibrational energy in said shaft;

said energy being transferred through said crank arm to said bit and causing said bit to orbit relative to said housing inertia at said sonic frequency thereby effecting drilling action limited in accordance with the throw of the crank arm.

4,693,326

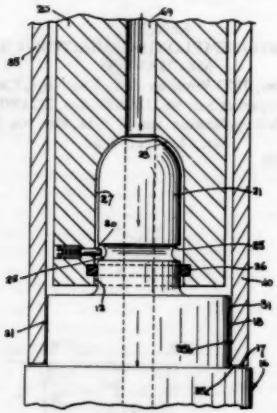
CYCLOIDAL EARTH CUTTING SYSTEM WITH ROCKER-TYPE NUTATING ACTION

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Continuation-in-part of Ser. No. 505,954, Jun. 20, 1983, which is a continuation-in-part of Ser. No. 262,650, May 11, 1981, Pat. No. 4,403,665. This application May 20, 1985, Ser. No. 736,079

Int. Cl.[4] F21B *7/24*

U.S. Cl. 175—55 **12 Claims**



1. In a sonic drilling system for drilling a bore hole including an oscillator for generating sonic energy in a cycloidal mode of vibration said oscillator having a housing which is driven by said sonic energy, and a bit assembly coupled thereto, the improvement being rocker type coupling means for guiding the housing and the bit assembly to form a pivotal fulcrum which permits limited motion of the bit assembly both vertically and laterally in a nutating pattern, comprising:

a horizontal shoulder formed on the top portion of the bit assembly;

a vertical shoulder formed on the top portion of the bit assembly;

vertical motion limiting means positioned directly opposite the horizontal shoulder for permitting limited freedom of vertical motion of the bit assembly relative to the housing; and

lateral motion limiting means positioned directly opposite the vertical shoulder for permitting limited freedom of lateral motion of the bit assembly relative to the housing;

said rocker type coupling means forming the fulcrum of a lever arm for the bit assembly so as to enable the bit assembly to nutate in a rocking fashion against the bore hole in response to the sonic driving.

4,693,327

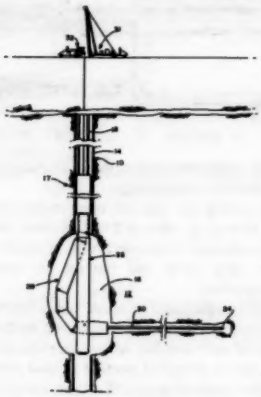
MECHANICALLY ACTUATED WHIPSTOCK ASSEMBLY

Robert W. Dickinson, 40 Maplewood Dr., San Rafael, Calif. 94901; Charles S. Mackey, Kern County, and Irving L. Odgers, Placer County, both of Calif., assignors to Ben Wade Oaks Dickinson and Robert W. Dickinson, both of San Francisco, Calif.

Filed Dec. 23, 1985, Ser. No. 811,571

Int. Cl.[4] E21B *7/08*

U.S. Cl. 175—61 **14 Claims**



1. Earth well drilling apparatus comprising structure including whipstock means adapted to be positioned within an earth well adjacent to a mineral bearing formation, said whipstock means comprising a plurality of connected guideway links laterally extendible from a retracted position substantially within the well to an extended position forming a curved tube bending guideway, piping within the well to which said whipstock means is attached, anchor means operatively connected to the rearward side of said whipstock means and having a retracted position for sliding through said earth well and an anchoring position for locking in a fixed position relative to said earth well, and erection means slidable within said earth well, said erection means being pivotally connected at one end to a forward one of said guideway assemblies and at the other end to extension means extending to the earth surface, said pivotal connection being of a type to cause said guideway links to swing into said curved guideway to extend a substantial distance outside of said well into said formation when said extension means is pulled from the earth surface with said whipstock means fixed at its rearward end.

6. A method for placing a radial tube laterally into a mineral bearing formation for drilling from an earth well which extends downwardly from the surface of the formation to the region of radial tube placement, said method making use of a structure comprising whipstock means including a plurality of connected guide links laterally extendible from a retracted position substantially within the earth well to an extended position forming a curved tube bending guideway for a drilling tube to be extended radially into the formation, anchor means operatively connected to the rearward side of said whipstock means and having a retracted position sliding within said earth well and an anchoring position for locking in a fixed position relative to said earth well, and erection means slidable within said earth well, said erection means being pivotally connected to a forward one of said guide links and at the other end to extension means extending to the earth surface, said method comprising moving said whipstock means adjacent to the mineral bearing formation with said whipstock means and anchor means in a retracted position, moving said anchor means into said anchoring position, pulling from the earth surface on said extension means of said erection means to cause

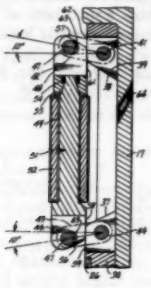
said forward one of said guide links to pivot away from said well to a sufficient extent to form said curved tube bending guideway, and moving a drilling tube through said guideway to cause it to bend and pass into said formation forming a radial tube.

4,693,328

EXPANDABLE WELL DRILLING TOOL

John H. Furse; Praful C. Desai, both of Kingwood, and Charles H. Dewey, Houston, all of Tex., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Jun. 9, 1986, Ser. No. 871,767
Int. Cl.[4] E21B *17/10*
U.S. Cl. 175—273 **33 Claims**



1. An expandable well drilling tool comprising:

an elongated generally cylindrical body;

means at an upper end of the body for connection to a drill string;

a well wall engaging element mounted on the body for movement between a radially retracted position at least in part within the body and a radially extended position at least in part outside the body;

first camming means fixed on the body for camming the wall engaging element from the retracted position toward the extended position;

second camming means for camming the wall engaging element from the retracted position toward the extended position, the wall engaging element being between the first and second camming means in the retracted position; and

means for shifting the second camming means axially along the body toward the first camming means for squeezing the wall engaging element toward the extended position.

4,693,329

ELECTONIC SCALE WITH LABEL CHARACTER SIZE CHANGE CAPABILITY

Michiyasu Hikita, Kusatsu, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Nov. 29, 1984, Ser. No. 676,243
Claims priority, application Japan, Nov. 29, 1983, 58-225174
Int. Cl.[4] G01G *23/38, 23/22;* G01D *9/00*
U.S. Cl. 177—4 **6 Claims**

1. An electronic scale, comprising:

a weighing unit for weighing an article and generating a weight signal corresponding to the weight of the article;

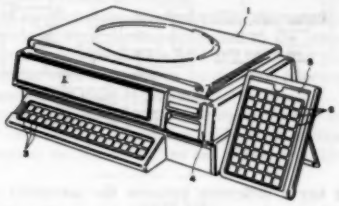
a key input unit for generating a character code signal corresponding to the article, including an article name signal represented by one character corresponding to the article, for generating a recall signal corresponding to each character code signal, and for respectively selecting and specifying the size of characters to be printed in accordance with the name, weight and price of the article, the size capable of being different for each of the name, weight and price;

an arithmetic control unit, operatively connected to said weighing unit and said key input unit, for computing the price of the article based on the weight signal and the character code signal, and for generating a price signal corresponding to the computed price;

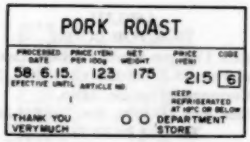
a memory for storing characters corresponding to keys included in said key input unit;

storage means for storing the specified size of the characters;

conversion means for converting characters stored in said memory to character codes of the specified character size;



EXAMPLE OF PRINTED LABEL



a storage unit, operatively connected to the arithmetic control unit, for storing article data in accordance with the character code signal;

a display unit, operatively connected to the arithmetic control unit, for displaying characters corresponding to the weight and price of the weighed article in accordance with the weight and price signals using the character codes; and

a printer, operatively connected to the arithmetic control unit, for printing characters of the specified size corresponding to the weight, price and name of the weighed article in accordance with the weight, price and article name signals using the character codes.

4,693,330

LOAD CELL SCALES

Mitsuo Uchimura, and Tsutomu Masuyama, both of Numazu, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed May 2, 1986, Ser. No. 858,951
Claims priority, application Japan, May 15, 1985, 60-103530
Int. Cl.[4] G01G *19/40, 19/52, 23/14*
U.S. Cl. 177—25 **9 Claims**

1. A load cell scale comprising:

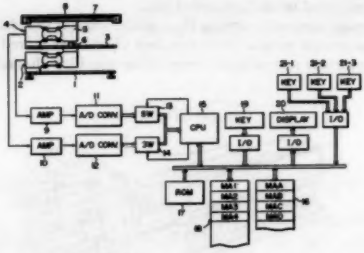
weight data generating means for generating weight data corresponding to load weight;

said weight data generating means including heavy- and light-range load cells provided one on the other, said load cells producing output signals according to load weight applied thereto, and weight data generating circuit means for converting the output signals from said load cells into weight data;

memory means having first and second memory areas, said memory means including a nonvolatile memory;

first and second keys; and

data processing means including means for storing in response to an operation of said first key the weight data from said weight data generating means, as zero-point data, into the first memory area of said memory means, means for storing in response to an operation of said second key a difference between the zero-point and the weight data from said weight data generating means into the second memory area of said memory means as span data, and means for producing the weight data resulting from multiplication of the weight data from said weight data generating means by a value as obtained by dividing a preset value by the span data.

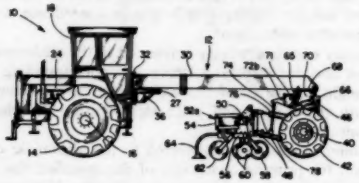


4,693,331

TRACTOR BOOM

James A. Johnson, Cologne; Richard Schulz, Lake Crystal, both of Minn., and Vincent J. Tomlonovic, Colfax, Iowa, assignors to Hiniker Company, Mankato, Minn.

Filed Apr. 23, 1986, Ser. No. 855,146
Int. Cl.[4] B62D *13/00*
U.S. Cl. 180—135 **10 Claims**



1. An agricultural tractor comprising:

an aft drive frame having an engine and a plurality of aft drive wheels mounted thereto;

a forward frame having a plurality of forward drive/steering wheels mounted thereto;

an elongated boom having an aft end portion pivotally coupled to said aft drive frame and a forward end portion fixedly coupled to said forward frame;

hitch means coupled to an aft portion of said forward frame and adapted to engage and carry a toolbar having a plurality of soil engaging implements positioned in spaced relation along the length thereof;

first control means coupled between said forward frame and said hitch means for raising and lowering said toolbar and the implements mounted thereto between a nonuse and a use position, said first first control means including a hydraulic power system and a plurality of hydraulic cylinders under the control of said hydraulic power system;

a depth control cylinder coupled between said hitch means and said forward frame and further coupled to and actuated by said hydraulic power system for raising and lowering said toolbar and implements positioned thereon in controlling the operating depth of said implements in the soil; and

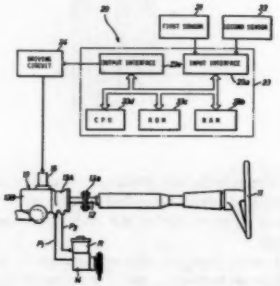
first and second hydraulic motors coupled to said hydraulic power system and to a respective forward drive/steering wheel for rotationally displacing said forward drive/steering wheels in imparting movement to the tractor.

4,693,332

ELECTRIC CONTROL APPARATUS FOR POWER STEERING SYSTEM

Hiroshi Miyata, and Shinji Katoh, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 20, 1985, Ser. No. 767,508
Claims priority, application Japan, Aug. 20, 1984, 59-173546
Int. Cl.[4] B62D *5/08*
U.S. Cl. 180—142 **7 Claims**



1. An electric control apparatus for a power-assisted steering system in a wheeled vehicle including a steering shaft arranged to be rotated by a driver's steering effort applied thereto; a hydraulic power cylinder having a power piston mounted for reciprocating movement in said cylinder and operatively connected to driven members of the steering system; a servo valve interconnecting a hydraulic pressure source and said cylinder and being responsive to rotary motion of said steering shaft for selectively directing the flow of fluid under pressure from said pressure source to one of opposite fluid chambers of said cylinder and permitting the flow of fluid from the other fluid chamber to a fluid reservoir to effect reciprocating movement of said power piston; and an electrically operated bypass valve disposed within a bypass passage for permitting bypass flow of fluid passing therethrough between said pressure source and said reservoir in its energized condition;

the electric control apparatus comprising:

first detecting means for detecting a travel speed of the vehicle to produce a first electric signal indicative thereof;

second detecting means for detecting a rotation speed of a prime mover of the vehicle to produce a second electric signal indicative thereof;

means responsive to said first and second electric signals for determining an optimum steering effort amount based on predetermined respective functions of both of the vehicle speed and the rotation speed of the prime mover, and for producing an electric control signal indicative of such optimum steering effort; and

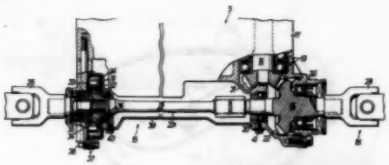
means for applying said electric control signal to said bypass valve to control the opening degree thereof in accordance with the value of said electric control signal.

4,693,333

POWER TRANSMISSION APPARATUS FOR VEHICLES

Yosio Oka, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1986, Ser. No. 839,645
Claims priority, application Japan, Mar. 22, 1985, 60-58058
Int. Cl.[4] F16D *41/02*; B62J *15/00*
U.S. Cl. 180—233 5 Claims



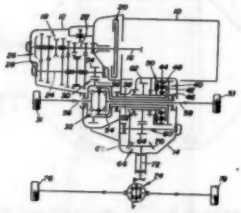
1. A power transmission apparatus for a vehicle comprising:
an output shaft for transmitting power from a power unit to the front and rear wheels of said vehicle;
a front wheel driving device for driving the vehicle front wheel;
a rear wheel driving device for driving the vehicle rear wheel;
a driving shaft operatively driven by said output shaft interposed between said front wheel driving device and said rear wheel driving device and having one end connected to said front wheel driving device and the other end connected to said rear wheel driving device; and
said front wheel driving device including a unidirectional clutch for transmitting a driving force during forward movement of the vehicle only in one direction from said power unit to the vehicle front wheel.

4,693,334

FOUR WHEEL DRIVE SYSTEM

Kazuyoshi Hiraiwa, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 7, 1986, Ser. No. 848,490
Claims priority, application Japan, Apr. 9, 1985, 60-73517
Int. Cl.[4] B60K *17/34*
U.S. Cl. 180—249 6 Claims



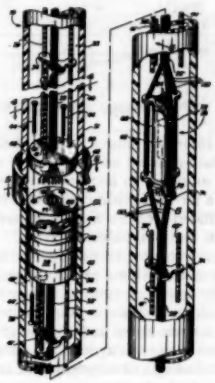
1. A full-time four wheel drive system comprising:
a transverse engine having a crankshaft;
a transaxle case having a side where it is attached to said engine;
a transfer case attached to said transaxle casing on said side thereof;
a speed change mechanism disposed within said transaxle case and having an input shaft in axial alignment with said crankshaft and an output shaft in parallel with said input shaft;
a final reduction gearing disposed within said transaxle case and having an input portion drivingly connected to said output shaft of said speed change mechanism and an output portion;
a planetary gear type center differential disposed within said transfer case and having an internal gear, a sun gear, a plurality of pinion gears meshing with said internal gear and said sun gear and a pinion carrier rotatably carrying thereon said pinion gears;
a viscous clutch interposed between said internal gear and said sun gear for controlling operation of said center differential;
a first hollow shaft interconnecting said output portion of said final reduction gearing and said pinion carrier of said center differential;
a terminal differential for a pair of left and right road wheels;
a second hollow shaft passing through said first hollow shaft to interconnect one of said internal gear and said sun gear and said terminal differential;
a speed-up mechanism disposed within said transfer case and having an input portion connected to the other of said internal gear and said sun gear and an output portion;
a propeller shaft elongated in the direction intersecting said crankshaft at right angles; and
a direction changing mechanism disposed within said transfer case and interconnecting said output portion of said speed-up mechanism and an end of said propeller shaft.

4,693,335

MULTI CHANNEL BOREHOLE SEISMIC SURVEYING TOOL

Harold A. Almon, P.O. Box 3816, Midland, Tex. 79702

Filed Nov. 22, 1985, Ser. No. 800,748
Int. Cl.[4] E21B *47/00*; G01V *1/40*
U.S. Cl. 181—102 8 Claims



1. Apparatus for seismic surveying a borehole drilling into the earth comprising an elongated resilient tubular housing of a size to be telescopingly received within the borehole, a plurality of sensors, a plurality of stress members, and a plurality of fluid block means;
said housing having a closure means at the upper end thereof by which a stress member is connected to a wireline, and by which signals received by the sensors are transmitted along the wireline to the surface of the ground;
said fluid block means are received within said housing in spaced relationship respective to one another, and in sealed relationship respective to the housing, and thereby form axially spaced sealed chambers between adjacent fluid block means; each of said fluid block means is a cylindrical member having an outer cylindrical surface thereof sealed respective to an inner cylindrical surface of the housing, means for arresting relative movement between said fluid block means and said housing;
said stress member is an elongated, flexible load carrying member which has opposed ends affixed to adjacent ones of said fluid block means; there being at least one stress

member located in each of said chambers and arranged parallel to the central axis of the housing;

said stress member having opposed terminal ends connected to adjacent ones of said fluid block means with the tension of one stress member being transferred through each of said fluid block means and into a next adjacent stress member;

support means by which at least one of said sensors is supportedly attached to the stress member and located within each of said chambers;

each sensor is provided with circuit means by which a seismic signal is transferred through the fluid block means and into the wireline;

and an incompressible fluid contained within each said chamber, whereby;

said apparatus can be attached to a wireline, lowered into a borehole, so that seismic energy resulting from the detonation of a nearby seismic charge can be received by each sensor and transmitted uphole for analysis.

4,693,336

UNDERWATER SEISMIC TESTING

Paul Newman, Westerham, United Kingdom, assignor to Horizon Exploration Limited, Swanley, United Kingdom

Continuation of Ser. No. 521,121, Aug. 6, 1983, abandoned. This application Aug. 13, 1986, Ser. No. 894,756

Claims priority, application United Kingdom, Aug. 18, 1982, 8223730

Int. Cl.[4] G01V *1/00, 1/38*

U.S. Cl. 181—111 **10 Claims**

1. A method of marine seismic investigation which comprises:

(1) positioning a reference source at a predetermined point proximate a multi-element seismic source array wherein said reference source is an acoustic pressure wave point source having a far-field seismic signature of broad bandwidth and a radiated pressure wave field having a strength less than that of said multi-element array;

(2) firing the multi-element source array and the point source at separate instances within a predetermined time range;

(3) simultaneously recording seismic signals reflected from sub-surface geological strata in response to firing of the multi-element source array and the point source array wherein the recording is carried out using two hydrophone arrays including a first hydrophone array contained in a conventional hydrophone streamer and a second hydrophone array contained in a streamer having a length less than said conventional streamer and positioned between the source array and the conventional hydrophone streamer; and wherein said second array is a high resolution multi-channel hydrophone array; and

(4) processing the recorded response so that (i) the response derived from the firing of the reference source is used to generate a high-resolution first seismic section and (ii) the response derived from the multi-element source array is used to generate a second seismic section.

4,693,337

COMPACT CATALYTIC CONVERTER

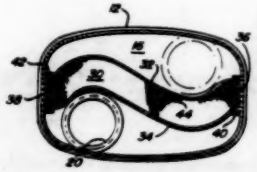
Dieter M. Timmermeister, Waterloo, Canada, assignor to Tri-D-Automotive Industries, Ltd., Waterloo, Canada

Continuation-in-part of Ser. No. 732,311, May 9, 1985, abandoned. This application Dec. 23, 1985, Ser. No. 812,549

Int. Cl.[4] F01N *3/02*

U.S. Cl. 181—231 **14 Claims**

1. A catalytic converter comprising a housing, a gas pervious catalyst support member extanding across the housing and dividing the housing into an upper chamber and a lower chamber, said catalyst support member comprising two parallel spaced apart upper and lower foraminous sheets which undulate across the width of the container and which each has a single peak and a single trough to form a catalyst containing chamber between the two sheets having a generally sinusoidal-type wave configuration when viewed in cross-section along a plane perpendicular to the length of the housing, a bed of



catalyst particles substantially filling the catalyst containing chamber, gas inlet means at one end of the housing positioned to cause gases to enter into one of the upper and lower chambers and pass through the catalyst support member and the catalyst containing chamber to the other of the upper and lower chambers, and gas outlet means at an opposite end of the housing and positioned to cause the gases to leave from the other chamber.

4,693,338

EXHAUST MUFFLER FOR A MOTOR VEHICLE OR THE LIKE

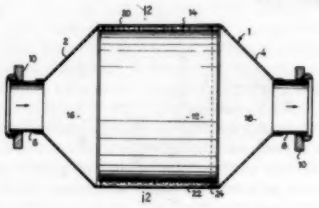
Michel Clerc, Valentigney, France, assignor to Cycles Peugeot, Valentigney, France

Filed Jul. 15, 1986, Ser. No. 885,636

Claims priority, application France, Jul. 16, 1985, 85 10900

Int. Cl.[1] F01N *1/24, 3/02*

U.S. Cl. 181—231 **11 Claims**



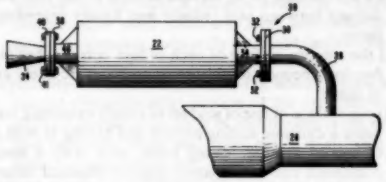
1. A catalytic exhaust muffler comprising at least one body of ceramic material, of the honeycomb type, a metal case coaxially enclosing the body and defining with the body an annular space around the body and inlet and outlet chambers at axially opposite ends of the body a blanket of fibres interposed between the body and the case in said annular space, the fibres of the blanket being very resistant to high temperatures, said blanket being substantially devoid of binder and devoid of water of constitution and being highly compressed between the body and the case, said case comprising two half shells which have an arcuate cross-sectional shape and means interconnecting said half-shells, each half-shell having axially opposite end portions extending toward the axis of the body inwardly beyond an outer periphery of the body, and a sealing element surrounding an end of the body of ceramic material which is the closest to the outlet chamber and is compressed between said case and said body.

4,693,339

MUFFLER FOR GAS INDUCTING MACHINERY GENERATING LOW FREQUENCY NOISE

Michael C. Beale, Franklin, and David H. Kasby, Hampton, both of Va., assignors to Newport News Shipbuilding and Dry Dock Company, Newport News, Va.

Filed Oct. 16, 1986, Ser. No. 919,439
Int. Cl.[4] F01N *1/08*
U.S. Cl. 181—255 35 Claims



1. For gas inducting machinery having a determinable displacement of the largest equivalent cylinder and a gas inlet, a muffler comprising:

a buffer reservoir having an inlet and an outlet,

said outlet being communicable with the gas inlet,

said buffer reservoir having a volume of between twenty and thirty times the displacement of the largest equivalent cylinder of the gas inducting machinery,

a convergent/divergent nozzle connected to said reservoir inlet,

said nozzle including a throat through which the gas passes into said buffer reservoir, and

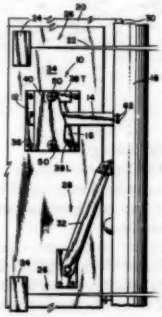
said throat being dimensioned relative to said machinery to obtain a gas flow speed in said throat of at least Mach 0.7.

4,693,340

BUMPER GUIDE ASSEMBLY FOR ELEVATOR DOORS

Ernest R. Shanks, 6990 S. Steele St., Littleton, Colo. 80122, and Gerald L. Carnes, 6752 E. Exposition Ave., Denver, Colo. 80224

Filed Sep. 30, 1985, Ser. No. 781,695
Int. Cl.[4] B66B *13/08, 13/26*
U.S. Cl. 187—52 R 2 Claims



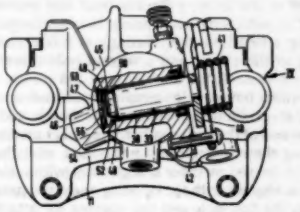
1. For use in an elevator cab door of the type mounting both an electric-eye-triggered optical system and a bumper-triggered mechanical system positioned alongside one another, said systems each being independently operative to actuate a mechanism to open the door when the latter is obstructed, and wherein the bumper of the mechanical system whose function it is to actuate the door-opening mechanism as it moves from its retracted operative position into its extended inoperative position may upon becoming misaligned interrupt the light beam generated by the optical system thus causing the door-opening mechanism to actuate and keep the door open even through unobstructed, the guidance assembly for keeping the bumper aligned and out of the way of the light beam which comprises: a rigid arm attachable to the bumper of the mechanical system for reciprocating movement therewith between its extended and retracted positions and a slotted housing attachable to the cab door for movement therewith, said housing including front and rear guide members with upper and lower spacers positioned therebetween all cooperating to define a side-opening guide slot positioned and adapted to slidably receive the arm and maintain same together with the bumper attached thereto aligned out of the path of the light beam during the excursion thereof between its retracted and extended positions; and, spring means yieldably biasing the front guide member into spaced substantially parallel relation to the rear guide member.

4,693,341

DISC BRAKE FOR AUTOMOTIVE VEHICLES

Peter Drott, Frankfurt am Main, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 10, 1985, Ser. No. 786,266
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1984, 3438209
Int. Cl.[4] F16D *65/30*
U.S. Cl. 188—72.7 2 Claims



1. A disc brake for use in an automotive vehicle comprising, a brake carrier affixed to the vehicle, a brake housing straddling an edge of a rotatable brake disc, said brake housing being arranged axially slidably relative to the brake carrier, two brake linings positioned on opposite sides of said brake disc and straddled by the brake housing, a mechanical actuating device provided in the brake housing including an actuating shaft having a principal longitudinal axis rotatably supported in a bore having a longitudinal axis in the brake housing, said actuating shaft acting on at least one of the brake shoes and being provided with retaining means to limit axial movement of the actuating shaft in said bore said retaining means including,

a section of a circular ring-shaped member on said housing protruding into said bore and having a longitudinal axis offset from the longitudinal axis of said bore defining a crescent shaped projection along a circumferential portion of the bore said projection including a pair of parallel crescent-shaped radial surfaces,

a first cylindrical section proximate an interior end of said shaft concentric with the shaft principal longitudinal axis and having a diameter reduced from the diameter of said shaft, and

a second cylindrical section at the interior end of said shaft, said second cylindrical section being eccentrically arranged with respect to the first cylindrical section an amount defining a crescent shaped groove along a length of a circumferential portion of said shaft corresponding to at least a predetermined minimum angle of rotation of the shaft including a pair of parallel, crescent shaped radial boundaries, said projection receivable within said groove, whereby said shaft is axially retained in said bore and is

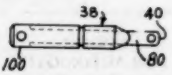
freely reversibly rotatable through an angle defined by the length of the circumferential portions of said bore and said shaft over which said respective crescent shaped projection and groove extend.

4,693,342

ROD ACTUATOR FOR AUTOMATIC SLACK ADJUSTING MECHANISMS

Daniel Lavely, Mt. Clemens, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 16, 1985, Ser. No. 734,530
Int. Cl.[4] F16D *65/46*
U.S. Cl. 188—79.5 K **8 Claims**



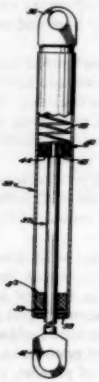
1. A rod actuator for connecting between a clevis mounted on the end of an actuating rod connected to an actuating lever and a slotted piston in a threaded plunger that adjusts slack in an automatic slack adjusting mechanism having a lever, an actuating rod connected to the lever to move the lever, a clevis attached to the actuating rod, a shaft connected to the lever, a threaded plunger connected to the shaft, a piston mounted for limited movement in the plunger, and an adjusting worm connected to the plunger and an adjusting gear connected to the worm and to the lever, a flexible boot seal provided with an enlarged lip, which actuator comprises an elongate rod member having a first hole therethrough at a first end thereof for attaching to the clevis, and a second hole therethrough at a second end thereof, for attaching to the piston, an elongate jacket member having a longitudinally extending cavity therethrough for receiving the rod member therein and registration of the first end of the rod member, the jacket member including an opening therethrough and positioned such that when the first end of the rod member is registered within the cavity, the first hole is aligned with the opening and a pin passing through the clevis, the first hole and the opening for attaching the rod actuator to the clevis and holding the rod member and the jacket member assembled together.

4,693,343

MULTI-LOBED RECTANGULAR SEALING RING

Richard M. Boyd, St. Louis Park, Minn., assignor to Quadion Corporation, Minneapolis, Minn.

Filed Jun. 12, 1985, Ser. No. 744,055
Int. Cl.[4] F16J *15/22*
U.S. Cl. 188—322.17 **21 Claims**



1. A sealing device comprising a continuously formed ring made of a resilient flowable material throughout and adapted to fit within a device having a sealing surface of ringlike configuration,

(a) said ring in its free form being uniform and generally rectangular in cross-sectional configuration and including a set of two opposed generally radially extending surfaces and a set of two opposed generally axially extending surfaces connected between adjacent portions of said radially extending surfaces;

(b) a corner lobe being formed at each of the four corners defined between said radially and axially extending surfaces;

(c) the exterior surface of each of said corner lobes in their free form being smoothly contoured and arcuately curved in shape;

(d) one surface of one of said set of axially extending surfaces being a dynamic sealing surface and having at least a pair of spaced annular sealing lobes, each with a smoothly contoured convexly-shaped exterior disposed intermediate said corner lobes adjacent that surface and in its free form extending a short distance outwardly beyond said corner lobes adjacent said one surface;

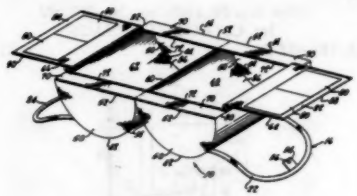
(e) the other surface of said set of axially extending surfaces being a passive sealing surface and having an outwardly extending annular sealing lobe with a smoothly contoured convexlyshaped exterior disposed intermediate said corner lobes adjacent said other surface and in its free form extending outwardly beyond said corner lobes adjacent said other surface.

4,693,344

COLLAPSIBLE CARRY BAG WITH FOUR DISCRETE RIGID END PIECES

Steven L. Shuler, 33772B Violet Lantern, Dana Point, Calif. 92629

Filed Feb. 22, 1985, Ser. No. 704,493
Int. Cl.[4] A45C *7/00*
U.S. Cl. 190—107 **7 Claims**



1. A carry bag comprising:

a flexible outer shell foldable along a centerline thereof and having two longitudinal edges and two transverse edges, said two transverse edges being parallel to one another and to said centerline;

four rigid semicircular end pieces, one attached along each of the flexible outer shell longitudinal edges, each of said end pieces being attached along a first portion of a circumference thereof from the flexible outer shell centerline to one of the flexible outer shell transverse edges enabling the flexible outer shell to be folded along the flexible outer shell centerline to close the flexible outer shell with the flexible outer shell transverse edges meeting one another upon such closure and a second portion of each end piece circumference meeting a corresponding second portion of another end piece upon closure of the flexible outer shell, each rigid semicircular end piece being foldably attached, along the second circumferential portion thereon, to the flexible outer shell for enabling two end pieces on each end of the carry bag to fold against one another with the flexible outer shell therebetween, said rigid end pieces

being attached along the second circumferential portion to enable alignment of a pair of said rigid semi-circular end pieces with one another when folded with the flexible outer shell therebetween;

a pair of flexible flaps, one each being attached to each of said flexible outer shell transverse edges and having sufficient length to extend between said flexible outer shell transverse edge and centerline, each said flexible flap being movable about the attached flexible outer shell transverse edge from a position extending between said flexible outer shell transverse edge and centerline to a position extending outwardly from said flexible outer shell transverse edges;

a plurality of flexible strips, one being attached to each of the second circumferential portion of the end pieces and to each transverse edge, each of said flexible strips engaging said centerline when said carry bag is in an open or unfolded configuration; and,

zipper means for releasably attaching said flexible strips to said flexible flaps when the flexible flaps are moved to a position extending between flexible outer shell transverse edge and centerline.

4,693,345

RECTANGULAR PARALLELPIPED ARRANGEMENT OF TWO CASES FOR AIR TRAVEL

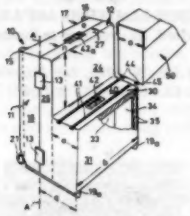
Gerhard Mitteimann, Oehningen, Fed. Rep. of Germany, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jul. 21, 1986, Ser. No. 887,268

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1985, 3526577

Int. Cl.[4] B65D *21/02*; A45G *5/12, 5/14*

U.S. Cl. 190—108 **11 Claims**



1. A multi-compartment travel case comprising a first clothes hanging compartment defined by first and second case shells hinged together along a hinge axis A, said first and second case shells each having a front wall, a pair of substantially parallel side walls and substantially parallel top and bottom strips; a second storage compartment defined by a top wall section, sidewalls and a bottom wall section projecting out from said front wall of said first case shell in a stepped like manner so as to form a substantially L-shaped configuration, said top wall section being provided with means for securing a storage case thereto; and a third storage compartment having a bottom wall provided with attachment means for attaching said third storage compartment to said securing means on said top wall section of said second storage compartment so as to form a rectangular parallelpiped.

4,693,346

CASE WITH HOLLOW FRAME

Aarnoud W. Eversdijk, 4 Wijkselaan, 2554 GE The Hague, Netherlands

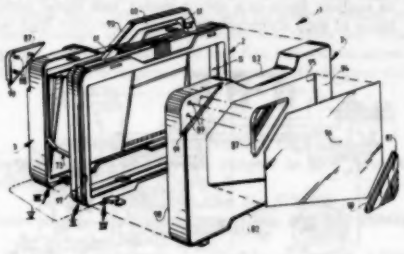
PCT No. PCT/NL84/00040, § 371 Date Jul. 17, 1985, § 102(e) Date Jul. 17, 1985

PCT Filed Nov. 29, 1984, Ser. No. 758,226

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1983, 3343068

Int. Cl.[4] A45C *5/04, 13/10*

U.S. Cl. 190—111 **13 Claims**



11. A carrying case which comprises the combination of a central section and a pair of side sections separate from and disposed on either side of the central section, said central section comprising a pair of complementary members of molded material, each of generally U-shaped cross section and joined to each other in opposed relation such that their U-shaped cross sections cooperate to define a substantially hollow, box-like rigid main frame of generally rectangular cross-section and of open, generally rectangular plan view extending circumferentially of and thereby circumscribing an open carrying space bounded on opposite sides thereof by said side sections, said side sections being of molded material and of dished form to define respective carrying spaces each open only at that side thereof facing the open carrying space defined by the central section and overlapping peripheral wall portions of the central section, and means carried by said central section and projecting downwardly thereof for defining a pivot axis and including connecting means pivotally mounted on the pivot axis and projecting from said pivot axis for pivotally connecting said side sections to said main frame for movements between closed positions which close the opposite sides of said carrying space to access and open positions exposing respective sides of said carrying space to access.

4,693,347

LOCK-UP CONTROL DEVICE FOR TORQUE CONVERTER IN AUTOMATIC TRANSMISSION FOR VEHICLE

Masao Nishikawa, Tokyo; Yoshimi Sakurai, Tanashi; Takashi Aoki, Fujimi, and Yoichi Sato, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 551,739, Nov. 14, 1983, Pat. No. 4,589,537. This application Mar. 13, 1986, Ser. No. 839,259

Claims priority, application Japan, Nov. 12, 1982, 57-198504; Dec. 10, 1982, 57-216355

Int. Cl.[4] B60K *41/22*; F16H *45/02*

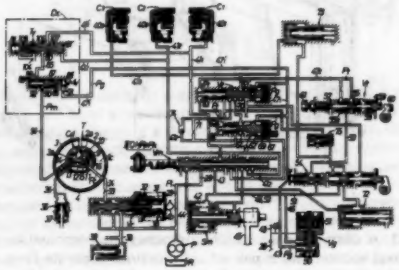
U.S. Cl. 192—3.3 **4 Claims**

1. In the automatic transmission for a vehicle, comprising a fluid type torque converter having an input member and an output member; a hydraulic direct coupling clutch provided between the input and output members and capable of being actuated to mechanically couple both members together; and auxiliary transmission connected to the torque converter and having plural stages of gear trains, the auxiliary transmission being capable of being changed in speed to a plurality of speed ratios by selection of the gear trains; and a control mechanism

for automatically effecting the selection of gear trains of the auxiliary transmission in accordance with the running condition of the vehicle,

a lock-up control device for the direct coupling clutch comprising:

a valve for controlling the supply of actuating oil pressure from a common oil pressure source to the direct coupling clutch, said valve having a body movable between opposite end position and adapted to take a first switch position at one of said end positions when applied with a single signal pressure and a second switch position at the other of said end positions, after release of the signal pressure, due to resilient force of a spring means, said signal pressure being of such a characteristic that it becomes high when



an intermediate gear train is selected to assume a specific gear ratio and it becomes low when higher and lower gear trains adjacent said intermediate gear train are selected to assume corresponding gear ratios adjacent said specific gear ratio, and wherein said valve allows flow of the actuating oil pressure to the direct coupling clutch when the valve body is at both the first and second switch positions and interrupts the flow during shifting movement of the valve body from the first to second positions or vice versa in response to gear shifting operation from said specific gear ratio to its adjacent gear ratios or vice versa, thus causing the direct coupling clutch to be instantaneously disconnected during gear shifting operation over adjacent three gear ratios with use of the single signal pressure.

4,693,348

DIRECT COUPLING CLUTCH WITH AN INTEGRAL DAMPER DEVICE FOR A FLUID COUPLING

Kazumasa Tsukamoto, Toyota; Masahiro Hayabuchi; Koji Maeda, both of Anjo; Kazuaki Watanabe, Toyota, and Yutaka Taga, Aichi, all of Japan, assignors to Aisin Warner Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

Filed Apr. 28, 1986, Ser. No. 856,765

Claims priority, application Japan, Apr. 30, 1985, 60-93453; Apr. 30, 1985, 60-93455

Int. Cl.[4] F16D *3/66*

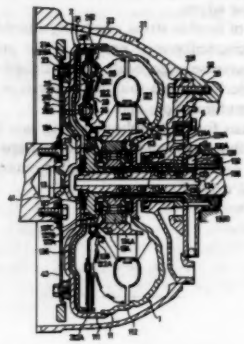
U.S. Cl. 192—3.29 **2 Claims**

1. A direct coupling clutch having an unitary assembled damper device for a fluid coupling comprising:

fluid coupling including at least an input shaft, an output shaft, a fluid casing concentrically secured with said input shaft, a pump impeller mounted on said fluid casing and a turbine runner connected to said input sahft through a turbine hub,

direct coupling clutch including a piston member axially slidably mounted on one of said output shaft and turbine hub and adapted to engage with and disengage from a portion of said fluid casing and a fluid line including at least a fluid passage being capable for selectlvely connecting a passage existing between said portion of said fluid casing and said piston member to a pressurized fluid source and a drain port; and

a unitary assembled damper device disposed between said turbine hub and piston member and being capable of connecting said hub and piston member, said unitary assembled damper device including a driven plate consisting of two annular guide plates positioned concentrically with each other and forming a double rows of toroidal spaces arranged along two concentric circles in equally spaced apart layout in circumferential directions therebetween, a plurality of resilient members inserted in each of



said toroidal spaces and located between radially extending side edges thereof, an annular drive plate having a number of radially extending edges formed therein and interposed concentrically with and between said guide plates and being slidable with respect to said guide plates in circumferential direction adapted to compress all of said resilient members between said side edges of the spaces formed in said guide plates and edges formed in said drive plate by relative rotation with respect to said driven plate and fastening means located between said two concentric circles to secure said guide plates with each other for unitary assembling said damper device.

4,693,349

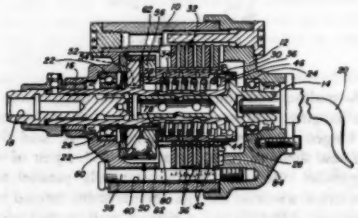
TORQUE LIMITING APPARATUS

John Tysver, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 25, 1986, Ser. No. 889,369

Int. Cl.[4] F16D *67/02*; B60T *7/12*

U.S. Cl. 192—7 **3 Claims**



1. An apparatus for limiting the amount of torque from a drive source supplied to a torque responsive element, comprising:

a disc-shaped rotatable input cam plate having ramp means;

a disc-shaped rotatable output cam plate having ramp means;

means for biasing the cam plates toward each other;

a plurality of angularly spaced balls for engaging the ramp

means of the input and output cam plates; and a disc-shaped retainer plate between the cam plates with angularly spaced holes for freely receiving and radially retaining the balls in engagement with the ramp means, the retainer plate including generally cylindrically shaped, axially projecting wall means for surrounding and axially piloting the cam plates.

4,693,350

CLUTCH-BRAKE UNIT

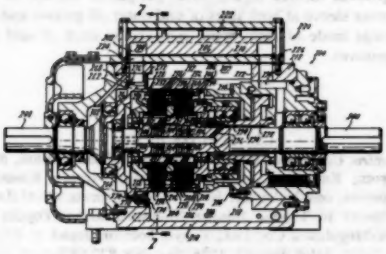
Gordon M. Sommer, Boca Raton, Fla., assignor to Sommer Co., Warren, Mich.

Continuation-in-part of Ser. No. 9,606, Feb. 5, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 180,987

The portion of the term of this patent subsequent to Jan. 15, 1997, has been disclaimed.

Int. Cl.⁴ F16D *13/72, 67/04*

U.S. Cl. 192—18 A **1 Claim**



1. A clutch-brake unit comprising:

an external housing, defining a central cavity between opposite longitudinally spaced end walls, having an oil reservoir in a lower portion thereof;

an input shaft extending into said cavity and rotatably journaled in one of said end walls, and having an enlarged diameter, annular extended portion provided thereon, said extended portion having,

a series of circumferentially spaced axially extending splines directed radially inwardly along the internal surface thereof, and

a plurality of integral radially outwardly directed vanes comprising gear teeth spaced circumferentially along a portion of the outer surface thereof;

oil passage means;

a pumping chamber enclosing the portion of said extended portion of said input shaft having said vanes, said pump chamber being separate from said central cavity, having an inlet port communicating with said reservoir, and having an outlet port communicating with said oil passage means;

a series of clutch plates having teeth at the outer periphery thereof wherein said plates are mounted at said teeth to the splines of said input shaft extended portion and said extended portion forms a clutch working chamber around said clutch plates;

an output shaft coaxial with said input shaft, extending into said cavity and rotatably journaled in the other of said end walls, said output shaft having an end portion interfitted within a portion of said input shaft, having a series of circumferentially spaced axially extending splines directed radially outwardly along the outer surface thereof, an axially extending oil passage opening out of said end portion, and radial passages extending outwardly from said axial passage;

a stationary annular inner housing fixedly mounted to said external housing;

a series of brake plates nonrotatably mounted within said stationary annular inner housing, said inner housing forming a brake working chamber around said brake plates;

first and second series of friction discs, having teeth along the inner periphery thereof, said discs mounted in axial spaced relationship on said output shaft wherein said teeth of said discs engage said splines of said output shaft, said first series of discs adapted to cooperate with said clutch plates when actuated to transmit rotational energy from said input shaft to said output shaft and said second series of discs adapted to cooperate with said brake plates when actuated to brake rotational movement of said output shaft;

actuating means for selectively actuating one of said first or second series of friction discs;

said vanes being operative to pump oil from said reservoir through said pump chamber, said oil passage means, said axial passage, said radial passages and across said clutch plates, said brake plates and said first and second series of friction discs in response to the rotation of said input shaft.

4,693,351

REVERSIBLE FREEWHEEL DEVICE

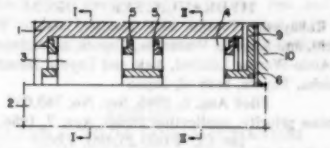
Rune Adolfsson, BorÅs, Sweden, assignor to SKF Nova AB, Gothenburg, Sweden

Filed Jun. 23, 1986, Ser. No. 877,138

Claims priority, application Sweden, Aug. 30, 1985, 8504032

Int. Cl.⁴ F16D *41/08*

U.S. Cl. 192—48.92 **1 Claim**



1. A reversible freewheel assembly having freewheeling and locking in both directions of rotation comprising drive and driven members having confronting raceways, a plurality of sprags in the annular space between the raceways disposed in a pair of side-by-side rows, the sprags in the rows being oriented in opposite directions, a cage for circumferentially spacing the sprags including biasing means normally biasing the sprags into contact with only one of the raceways to a freewheeling position, a braking ring operatively associated with all the sprags and means providing light contacting engagement with a portion of said braking ring whereby upon relative rotation of said drive and driven members in one direction, the sprags of said one row are moved by said braking ring against the biasing force into contact with both raceways and whereby relative rotation of said drive and driven members in the opposite direction, the braking ring effects contact of the sprags in the opposite row with both raceways.

4,693,352

CLUTCH MECHANISM

David J. Lang, Rockford; John C. Layer, Caledonia, and William G. Durtschi, Rockford, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Apr. 16, 1986, Ser. No. 852,770

Int. Cl.⁴ F16D *13/50*

U.S. Cl. 192—70.27 **9 Claims**

1. A clutch comprising:

a housing;

a first shaft;

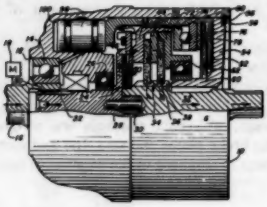
a second shaft coaxial with said first shaft;

a clutch pack comprising a plurality of relatively axially movable friction plates sandwiched by a first reaction plate and a second reaction plate, at least one of said friction plates being sandwiched by two other friction plates and mounted on one of said shafts for rotation therewith and said two other friction plates being mounted on the other of said shafts for rotation therewith;

said reaction plates being associated with one of said shafts for rotation therewith and being axially movable relative to each other to compress and release said friction plates;

a spring for moving said reaction plates toward each other;

a motor carried by said housing; and



a thrust bearing movable by said motor between a first position non-engaged with said plates and a second position urging at least one of said reaction plates away from the other of said reaction plates.

4,693,353

SUPPORT FOR TRANSMISSION SHAFT AND HYDRAULIC SERVO DRUM

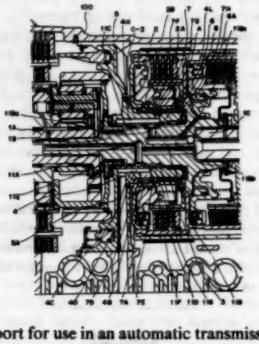
Koji Kobayashi, Toyota; Koji Sumiya, Nishio; Yutaka Taga, Aichi, and Kazuaki Watanabe, Toyota, all of Japan, assignors to Aisin-Warner Limited, Anjo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Aug. 6, 1985, Ser. No. 763,007

Claims priority, application Japan, Aug. 7, 1984, 59-166156

Int. Cl.[4] F16D *25/061, 13/58*

U.S. Cl. 192—85 AA **2 Claims**



1. In a support for use in an automatic transmission apparatus of the type having a transmission shaft for transmitting power, an annular hydraulic servo drum and a piston fitted in the hydraulic servo drum for engaging and disengaging a friction engaging means, wherein the support has an axially extending tubular supporting portion having an inner peripheral surface for supporting the transmission shaft, an outer peripheral surface for supporting an inner cylindrical portion of the hydraulic servo drum, and working oil passages formed therein and adapted for supplying and discharging a working oil to and from the hydraulic servo drum, the improvement wherein:

said support comprises:

a support body made of light material having a first radially extending oil passage leading from an oil pressure controller for supplying and discharging a working oil and communicating with the inner peripheral surface of said tubular supporting portion, a second radially extending oil passage providing a communication between the outer peripheral surface and the inner peripheral surface of said tubular supporting portion and an inner axially extending oil groove providing a communication between inner peripheral openings of said first and second oil passages;

an inner sleeve of a heavier material than said support body fitting on the inner peripheral surface of said tubular supporting portion to cover said inner axially extending oil groove thereby forming an oil passage for working oil; and

an outer sleeve of a heavier material than said support body fitting on the outer peripheral surface of said tubular supporting portion, said outer sleeve having an outer peripheral surface, a radially extending sleeve hole in said outer sleeve, said slave hole being aligned with a working oil port formed in the inner cylindrical portion of the hydraulic servo drum and communicating with an outer peripheral opening of said second oil passage, an outer oil groove being formed in the outer peripheral surface said outer sleeve to connect said second oil passage to the working oil port through said sleeve hole, and ring grooves formed in the outer peripheral surface of said outer sleeve at both sides of said outer oil groove and seal rings made of resin being received in each of said ring grooves.

4,693,354

CLUTCH DAMPER

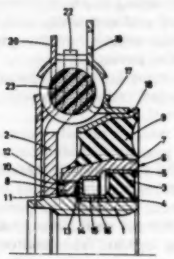
Mitsuhiro Umeyama; Kaoru Wakahara; Hisao Ohtani, all of Toyota; Kenichi Kametaka, Fujisawa; Masaru Kinoshita, Fujisawa, and Nobuyuki Kobayashi, Fujisawa, all of Japan, assignors to Toyota Jidosha Kabushikikaisha, Toyota and Nok-Megulastik Co., Ltd., Tokyo, both of, Japan

Filed Jan. 27, 1986, Ser. No. 822,987

Claims priority, application Japan, Feb. 19, 1985, 60-21332[U]

Int. Cl.[4] F16D *3/60*

U.S. Cl. 192—106.1 **5 Claims**



1. A clutch damper comprising a hub having an approximately cylindrical shape with an outwardly spread first plate provided at one axial end thereof, said hub being slipped over a shaft, a first buffer member formed into an annular body of a rubber-like resilient material and fitted and secured in the outer periphery of said hub, a boss having an approximately cylindrical shape and fitted and secured in the outer periphery of said first buffer member, a second buffer member formed into an annular body of a rubber-like resilient material and secured in the outer periphery of said boss, a cylindrical body and a second plate provided with a double-ring like plate spread outwardly from said cylindrical body and secured in the outer periphery of said second buffer member, a stopper mechanism for stopping relative rotation within a predetermned angle disposed between said hub and said boss and between said first plate of said hub and said double-ring like plate of said second plate, and spacer means for restraining play in both axial and diametral directions interposed between said hub and said boss, said spacer means comprising a center plate, a plate spring, a bearing plate and a fluorine-resin plate.

4,693,355
AUTOMATIC COMBINATORIAL WEIGHTING APPARATUS

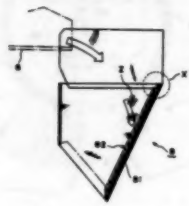
Hiroshi Bochi, Gamou; Kenji Ueda, Kyoto, and Satoshi Konishi, Kusatsu, all of Japan, assignors to Ishida Scales Mfg. Co., Ltd., Kyoto, Japan

Filed Nov. 12, 1985, Ser. No. 796,742

Claims priority, application Japan, Nov. 12, 1984, 59-170329[U]; Nov. 12, 1984, 59-170330[U]

Int. Cl.[4] B65G *11/00*; E04B *1/84*

U.S. Cl. 193—2 R **1 Claim**



1. An automatic weighing apparatus delivery path system including delivery paths mounted on a frame and for passage of articles to be weighed and a collection chute assembly disposed in and defining said delivery paths and comprising:

an inner collection chute coupled to the frame, in the form of a truncated cone having an outlet and comprising angularly joined flat panels;

a pair of outer collection chutes coupled to the frame, disposed outwardly of said inner collection chute and having respective outlets, and each comprising angularly joined flat panels;

a first discharge chute coupled to the frame, having an outlet and coupled to receive articles from the outlet of the inner collection chute;

a second discharge chute coupled to the frame, having a single outlet and coupled to receive articles from the outlets of said pair of outer collection chutes; and

a vibration damper having a vibration-restriction damping capability and disposed in an area of said delivery paths for damping vibration of said area arising from hitting engagement with the articles, said vibration damper comprising:

a vibration restricting plate contacting the area;

a viscoelastic member contacting said plate;

a vibration damping base contacting said member; and

a urethane coating covering the area, said base, said member and said plate.

4,693,356
STRUCTURE OF ROLLER TYPE CONVEYER

Yang Pi-May, No. 3, Lane 23, Alley 10, Pao-Chien Road, Chung-Ho, Taipei, Taiwan

Filed Mar. 3, 1986, Ser. No. 835,801

Int. Cl.[4] B65G *13/12*

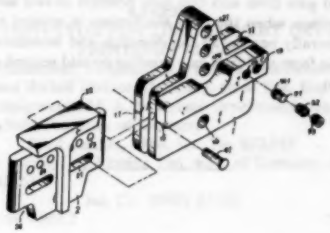
U.S. Cl. 193—35 TE **3 Claims**

1. A conveying device of which the space between rollers and the height of the rollers being adjustable, and said rollers being able to set up at a curved portion of said conveying device; and comprising:

roller rest of which both sides being furnished with grooves for mounting connection plates therein respectively;

connection plates, of which both sides being attached with roller rests respectively; and

the feature of the improvement of said device being that said roller rest being provided with several screw holes, and one end of each of said screw holes being furnished with flange; and a short bolt (31) having a semi-spherical head at one end and a spring being mounted in said screw hole, and one end of said screw hole being closed with an adjustable screw; and the flange furnished on said screw hole being used for preventing said short bolt from falling off,



and being used as a means to have the semi-spherical head of said short bolt exposed out of said screw hole; and said connection plate being provided with several semi-spherical holes for receiving the semi-spherical heads of said short bolts respectively upon said roller rest and said connection plate being assembled together so as to have said semi-spherical head portion firmly positioned in place.

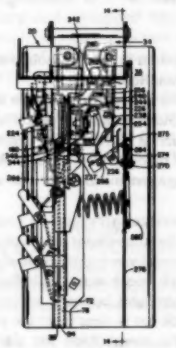
4,693,357
MULTIPLE CHUTE COIN MECHANISM

Weldon J. Aschenbeck, Shiner, Tex., and Frank W. Medley, III, Cookeville, Tenn., assignors to Kaspar Wire Works, Inc., Shiner, Tex.

Continuation-in-part of Ser. No. 661,078, Oct. 15, 1984, Pat. No. 4,579,215. This application Feb. 3, 1986, Ser. No. 825,340

Int. Cl.[4] G07F *5/04*

U.S. Cl. 194—202 **21 Claims**



10. A coin mechanism for use in a dispensing machine to receive and detect the presence of a predetermined number of coins, comprising:

at least first and second generally vertical coin chutes for receiving coins of a predetermined dimension and having a width and thickness of about, but greater than, the width and thickness of the coins;

a gate mounted in the mechanism movable between at least first and second gate positions for selectively directing coins into one of said chutes, said gate being operable in said first gate position to direct coins into said first chute

and being operable in said second gate position to direct coins into said second gate chute;

means for moving said gate at least from said first gate position to said second gate position in response to the presence of a coin in said first chute; and

a tilt responsive mechanism movably mounted in the mechanism and configured to move and engage said means for moving and prevent said means for moving from moving said gate from said first gate position to said second gate position when the coin mechanism is rotated in a plane generally parallel to the direction and movement of said gate from said first gate position to said second gate position.

4,693,358

VEHICLE BODY CONVEYANCE IN ASSEMBLY LINE

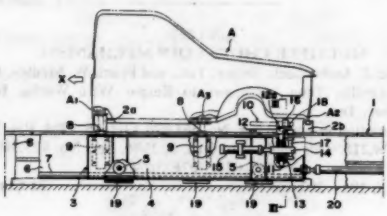
Tetsuro Kondo, and Tsuyoshi Ueda, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 4, 1986, Ser. No. 835,943

Claims priority, application Japan, Mar. 6, 1985, 60-45097

Int. Cl.[4] B21B *39/14*

U.S. Cl. 198—339.1 5 Claims



1. A conveyor system in an automobile assembly line which comprises, in combination:

a slat conveyor for conveying a vehicle body structure from one position towards another position past a door fitting position at which at least one door assembly is fitted to the body structure being conveyed, said slat conveyor having at least one engagement member movable together therewith;

a pair of side carriages arranged on respective sides of the slat conveyor for movement between initial and end positions along the slat conveyor, each of said carriages comprising a clutch mechanism including a catch bar supported for movement between a disengaged position, at which the catch bar is clear from the path of movement of the engagement member on the slat conveyor, and an engaged position at which the engagement member can be brought into engagement with the catch bar for transmitting the movement of the slat conveyor to the carriage to move the latter from the initial position towards the end position in unison with the movement of the slat conveyor, and a plurality of lift cylinders operable to lift the body structure a predetermined height above the slat conveyor during the passage of the body structure being conveyed through the door fitting station; and

a cylinder means for forcibly returning the carriages, once moved to the end position to the accompaniment of the movement of the slat conveyor, and the catch bars in said disengaged position to the initial position.

4,693,359

DEVICE FOR TRANSFERRING BAR-SHAPED ARTICLES

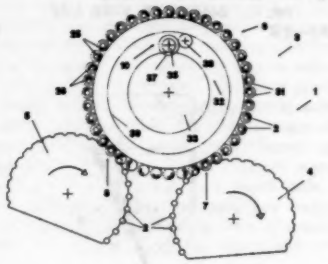
Riccardo Mattei, and Gastone Dall'Osso, both of Bologna, Italy, assignors to G.D Societa' per Azioni, Bologna, Italy

Filed Nov. 18, 1985, Ser. No. 799,326

Claims priority, application Italy, Dec. 6, 1984, 3647 A/84

Int. Cl.[4] B65G *29/00*; A24C *5/00*

U.S. Cl. 198—474.1 2 Claims



1. A device for transferring bar-shaped articles (2) along a determined path and for subjecting said articles (2), at least along part of said path, to a translational movement transverse to their longitudinal axis and a simultaneous rotation about their axis; the device (1) comprising a transfer roller (6), and an inlet roller (4) and outlet roller (5) which are rotatable in directions opposite that of said transfer roller (6) and are tangential to this latter along a first and, respectively, a second generating line of tangency which define along the periphery of said transfer roller (6) a transfer arc and a return arc which are conjugate to each other; said first and second generating lines of tangency being disposed such that the length of each of said transfer and return arcs is either equal to or is a respective whole multiple of a basic arc traversed by each said support element (25) about the axis of said drive shaft (9) during one complete revolution about its own said longitudinal axis; a drive shaft (9) coaxial to said transfer roller (6) and angularly rigid therewith, and operating means for rotating said drive shaft at constant angular speed; a plurality of support elements (25) for respective said articles (2), said support elements (25) being uniformly distributed about said transfer roller (6) and being coupled to this latter such that they each rotate relative to it about their respective longitudinal axis transverse to said path; and transmission means (32) interposed between said drive shaft (9) and said support elements (25) to cause these latter to undero said rotation about their respective said longitudinal axes; characterized in that said transmission means (32) are such as to cause each said support element (25) to make several complete revolutions at constant angular speed about its respective said longitudinal axis for one complete revolution of the same support element (25) about the axis of said drive shaft (9); said transmission means (32) comprising a sun gear (33) keyed on to said drive shaft (9), a fixed gear carrier (17,19), and an outer ring gear (40) coaxial to said drive shaft (9) and rotatable relative thereto; and each said support element (25) comprising a toothed wheel (31) coaxial to its said longitudinal axis and meshing with external toothing (42) coaxial to said drive shaft (9) and angularly rigid with said outer ring gear (40).

4,693,360

CONTINUOUS OPERATION BULK GOODS UNLOADER

Jorma Antikainen; Yrjö Olsoni, and Pentti Vilimäki, all of Hyvinkää , Finland, assignors to Kone Oy, Helsinki, Finland

Filed Aug. 19, 1981, Ser. No. 294,143

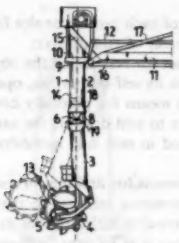
Claims priority, application Finland, Aug. 21, 1981, 802635

Int. Cl.[4] B65G *41/00*, *47/16*

U.S. Cl. 198—509 2 Claims

1. A continuously operated bulk goods unloader comprising

a vertical, tubular jib having an outer circumference, a supporter for said jib for maintaining the jib's direction, said supporter being affixed to a supporting structure carrying the unloader, an endless compartmented belt adapted to operate within the tubular jib, a detacher head supported on said jib for discharging bulk goods onto said belt, said vertical jib being subdivided into a lower part having an upper end and upper part having a lower end interconnected by a pivot, said belt



being enclosed within the periphery of said ends, and pressure cylinders for tilting the lower part of the jib about said pivot with reference to the upper part thereof, said pressure cylinders being disposed substantially parallel with the vertical jib between the upper and lower parts thereof when the upper and lower parts are vertical and being positioned within the outer periphery of the ends of both parts of the vertical jib adjacent to the pressure cylinders for protecting these cylinders from impact.

4,693,361

TRANSFER PRESS

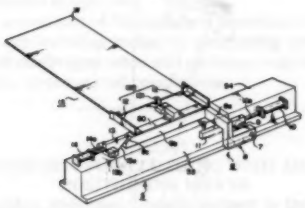
Kiyokazu Baba, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 4, 1983, Ser. No. 538,883

Claims priority, application Japan, Oct. 5, 1982, 57-150493[U]; Oct. 5, 1982, 57-150494[U]; Oct. 5, 1982, 57-150495[U]

Int. Cl.⁴ B65G *25/00*

U.S. Cl. 198—621 **11 Claims**



1. A transfer press comprising workpiece gripping finger units mounted in idle stations between adjacent moving bolsters, said finger units being pivotally mounted on central transfer bars substantially above said individual moving bolsters and between intermediate bars for pivotal movement about an axis on said central transfer bars for pivotally moving said finger units into an upward vertical position above said central transfer bars for movement into and out from the press body together with said bolsters and for pivotally moving said finger units into horizontal position above said intermediate bars when said bolsters and said transfer bars are in said press, said finger units each comprising an approximately L-shaped turning arm pivotally mounted through a pivot shaft on the outside surface of respective end portions of said central transfer bars, an upper member integrally connected to said turning arm and having at least one finger attached to the leading end thereof, and turning means for turning said turning arm up and down relative to said central transfer bars, said at least one finger being attached to the leading end of said upper member of said turning arm by a mounting member integrally connected to the leading end of said upper member and extending along the upper surface of said intermediate bar and in the longitudinal direction thereof.

4,693,362

CHAIN CONVEYOR FOR THE DELIVERY DEVICE OF PRINTING PRESSES

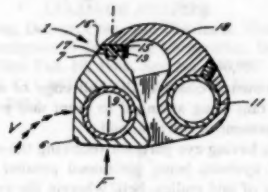
Klemens Kemmerer, Seligenstadt; Valentin Gensheimer, Muhlheim, and Rudolf Melzer, Hainburg, all of Fed. Rep. of Germany, assignors to M. A. N. Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 24, 1986, Ser. No. 822,021

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1985, 3502663

Int. Cl.⁴ B65G *47/86*

U.S. Cl. 198—803.7 **7 Claims**



1. A chain conveyor for a printing press, said chain conveyor having at least one gripper system being carried by endless conveying chains, the gripper system being secured to the conveying chains by way of connecting members retained by pins on said chains, said gripper system including a gripper shaft and a plurality of pivotably movable sheet engaging gripper members mounted on said gripper shaft,

wherein the improvement comprises, said gripper system having a unitary and elongated body member and a a tubular structural member disposed substantially at the center of gravity of the body member and extending the length thereof for enhancing the structural rigidity of said body member, and said body member having first integrally formed means for supporting said gripper shaft and second integrally formed means form for limiting pivotal movement of said gripper members when in a sheet engaging position.

4,693,363

CONTROL DEVICE AND PROCESS FOR ALIGNING AN ENDLESS BELT UTILIZING THE CONTROL DEVICE

Egbert Kuehnert, Erzhausen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 25, 1985, Ser. No. 791,448

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1984, 3439456

Int. Cl.⁴ B65G *39/16*

U.S. Cl. 198—807 **18 Claims**

1. A control device for aligning, in the running direction, an endless belt, comprising:

an endless belt which revolves around a driven roller and a deflecting roller, wherein said deflecting roller includes an axle extending transversely to the running direction of said endless belt;

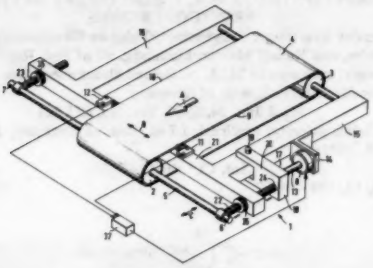
a first longitudinal member extending parallel to the running direction of said endless belt;

a pivotal wing which pivots about a pivot pin extending

through said first horizontal member perpendicularly to said endless belt;

a control circuit which includes at least two microswitches, one of which is positioned near each edge of said endless belt;

a lifting cylinder comprising an extendable ram for adjusting the position of one of the axle ends of said axle responsive to a signal received from one of said microswitches when



said microswitch contacts the belt edge of said endless belt, said ram being arranged to pivot said pivotal wing upon movement of the ram; and

two eyebolts having eye parts for receiving the ends of said axle, said eyebolts being positioned parallel to and on either side of said endless belt, wherein the eyebolt positioned on the same side of said endless belt as said pivotal wing extends to and abuts said wing.

4,693,364

BOX FOR HOLDING THIN OBJECTS

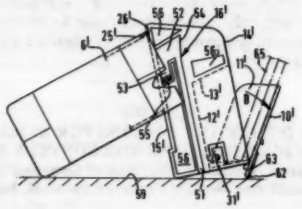
Thomas C. V. Wakelin, Bramcote 1, Norris Close, Firgrove Road, Whitehill, Hampshire GU32 9EG, United Kingdom

Division of Ser. No. 613,155, May 23, 1984. This application Sep. 23, 1986, Ser. No. 910,502

Claims priority, application United Kingdom, Jun. 1, 1983, 8315041; Mar. 27, 1984, 8407936

Int. Cl.[4] B65D *5/50*

U.S. Cl. 206—45.18 **11 Claims**



1. A box for holding thin objects, said box comprising:

an outer part, including two opposite side members and a top member,

a drawer, including two opposite side members and a bottom member, said side members of said outer part and said side members of said drawer being arranged in two adjacent pairs of one outer-part side member and one drawer side member per pair;

engagement means for interconnecting said drawer and said outer part so as to allow said drawer to be at least partially withdrawn from said outer part to a position whence said drawer can be swung through an angle of less than 180 degrees with respect to said outer part and engage in a self-supporting open position; said engagement means comprising:

a respective pin fixedly attached to one of each pair of side members so as to be positioned between its pair of side members,

a respective groove or slot extending in the other of each pair of side members for co-operating with said respective pin to interconnect said drawer and said outer part, and

a stop at an end of each groove or slot for stopping withdrawal movement of said drawer;

a restraining member for restraining the objects from falling out of said box in its self-supporting, open position;

pivotal connection means for pivotally connecting said restraining member to said drawer, the axis of pivotal connection positioned in said side members of said drawer; and

pivotal limitation means for limiting forward pivotal movement of said restraining member so that said restraining member has a forwards inclination in its restraining position when said box is in its open, self-supporting position supported on a flat surface; said pivotal limitation means arranged so that a forward edge of said restraining member abuts the flat surface when in its restraining position with said box open, for steadying of said box against tipping forward under weight of the restrained objects.

4,693,365

PACKAGE, INSTRUMENTATION, SYSTEM AND METHOD FOR PACKAGING FLACCID ITEMS, FILAMENTS AND THE LIKE

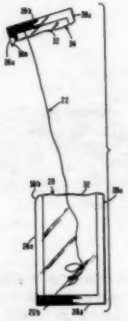
Arthur P. Corella, 8166 Vanscoy Ave., North Hollywood, Calif. 91602

Continuation-in-part of Ser. No. 723,353, Apr. 15, 1985, Pat. No. 4,579,221. This application Mar. 26, 1986, Ser. No. 844,199

The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.

Int. Cl.[4] A61L *17/02*

U.S. Cl. 206—63.3 **23 Claims**



1. A package enclosing at least one continuous, untangled, flaccid item comprising:

a fully sealed enclosure including a compartment;

said flaccid item having an intermediate portion terminating in oppositely disposed end portions, with said intermediate portion being freely housed within said compartment and said oppositely disposed end portions being separately secured to said enclosure; and

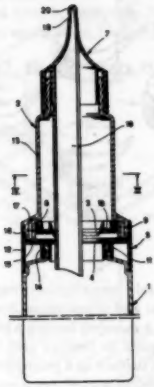
said enclosure having a construction for enabling its rupture and access to said flaccid item portion housed within said compartment for untangled removal therefrom.

4,693,366

PACKAGING MEANS IN TWO PARTS

Antonin Goncalves, Grosiay, France, assignor to The French Joint Stock Company "L'Oreal", France

Filed Dec. 29, 1986, Ser. No. 947,381
Claims priority, application France, Jan. 10, 1986, 86 00277
Int. Cl.[4] B65D *25/08*
U.S. Cl. 206—222 16 Claims



1. In a packaging means comprising first and second parts which can be assembled together, said first part comprising:-

(a) a first compartment;

(b) a second compartment defining a cap surmounting the first compartment;

(c) first and second diaphragms separating first and second compartments from each other; and

(d) an intermediate part joining the said first and second compartments;

the improvement wherein:-

(e) said two diaphragms are fixed to said second compartment;

(f) said second compartment is closed at its upper portion by a releasable stopper; and

(g) said second part of the package is constituted by a perforator cap including means for perforating the first and second diaphragms when said perforator cap is placed in position on the second compartment.

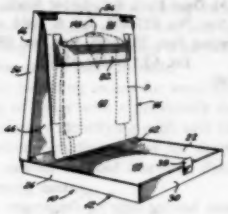
4,693,367

SHIPPING BOX FOR CLOTHING WITH ARTICLE POSITIONING MEANS

Andre Mathieu, St-Hilaire, Canada, assignor to Dorfin Paper Products (Quebec) Limited, Montreal, Canada

Filed Sep. 22, 1986, Ser. No. 909,627
Claims priority, application Canada, Sep. 16, 1986, 518281
Int. Cl.[4] B65D *85/18, 25/10*
U.S. Cl. 206—289 5 Claims

1. A shipping box comprising a tray defined by a first panel and side and front end walls, a hinge panel extending along the rear edge of the first panel, and a lid connected to the hinge panel and including a second panel, the second panel including depending side walls and a front wall extending from the edges thereof, the improvement comprising a third panel insertable within the tray and including a front face and a rear face, the panel having a head portion and a bottom edge, a sub-panel extending from the rear face and defining a slot extending transversely relative to the third panel, garment hanger receiving means provided on the head portion of the panel whereby a garment can be hung from a garment hanger and draped about the bottom edge of the third panel over the rear face of the third panel and further draped through the slot in the



sub-panel to thereby hang from the sub-panel and be retained on the third panel in a firm position.

4,693,368

COMBINATION GARMENT BAG AND PACKING CASE LUGGAGE ARTICLE

William L. King, Denver, Colo., and Charles K. Weisbart, Mequon, Wis., assignors to Samsonite Corporation, Denver, Colo.

Filed Feb. 19, 1986, Ser. No. 830,995
Int. Cl.[4] A45C *3/00, 5/12, 13/26, 13/34*
U.S. Cl. 206—287.1 46 Claims

1. A luggage article, comprising:

a flexible garment bag enclosure comprising an exterior elongated panel, an interior elongated panel, and means providing side walls between the interior and exterior panels the interior and the exterior panels having their longer dimensions oriented generally longitudinally, the side walls including a top transverse end side wall, a bottom transverse end side wall, a left longitudinal side wall and a right longitudinal side wall, the panels and side walls defining a space within the garment bag enclosure for receiving garments on hangers attached near the top end side wall; and

a packing case enclosure including means for permanently connecting the packing case enclosure to the interior panel and means for pivotably connecting the packing case enclosure to the bottom end side wall and means for selectively connecting the packing case enclosure to the lower portion of the left and right longitudinal side walls;

the garment bag enclosure extending sufficiently longitudinally to fold over and substantially embrace a top border piece and an outside partition piece of the packing case enclosure when in a transportation condition, the top end and the bottom end side walls being oriented generally in alignment with a bottom border piece of the packing case enclosure when in the transportation condition.

4,693,369

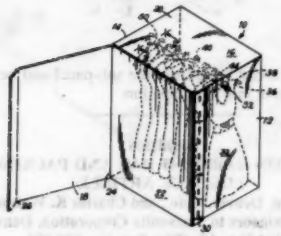
CLOTHES HANGING SYSTEM AND THEFT-PROOF SHIPPING SYSTEM

Herbert Lagin, 31 Deer Park Rd., Great Neck, N.Y. 11024

Continuation of Ser. No. 627,492, Jul. 6, 1984, abandoned. This application Jun. 25, 1986, Ser. No. 880,341

Int. Cl.[4] B65D *85/18*

U.S. Cl. 206—290 **1 Claim**



1. A garment support system for both hanging and shipping garments in a creaseless manner and, after shipping, for hanging the garments on a conventional retail garment rack having a horizontal cylinder rod, comprising:

(a) a shipping carton having a pair of opposed side walls;

(b) a plurality of hangers each having

(i) a hanger body with a pair of longitudinally extending shoulders for supporting a garment,

(ii) a first hanger support means centrally located and connected to said hanger body comprising a conventional open-sided horizontal rod engaging supporting hook capable of being selectively secured to and detachable from said conventional retail garment rack,

(c) a horizontally extending rigid, cylindrical support rod for providing complete load support and simultaneous theft prevention, during shipping of said hangers and garments in said shipping carton and wholly exclusive of support provided by said first hanger support means during shipping, said horizontal cylinder support rod being provided, at each end, with connection means for selectively attaching it to said side walls of said shipping carton,

(d) each of said hangers having a second hanger support means mechanically independent from said first hanger support means, comprising an aperture passing through said hanger body, said second hanger support means being capable of selectively being supported by said horizontal cylinder support rod by being first passed through said aperture and attached to said side walls of said shipping carton by said connection means and serving to lock said hanger and said garment thereon to said horizontal cylinder support rod during shipping of a garment and to facilitate, after shipping, the renoval of all hangers and garments simultaneously from said shipping box and the placement of all hangers and garments, simultaneously, on said conventional retail garment rack,

(e) said first hanger support means and said second hanger support means being alternatively usable at the same time without any physical alteration of said hanger or said first or second hanger support means, and

(f) said hangers all being made from a single piece of material.

4,693,370

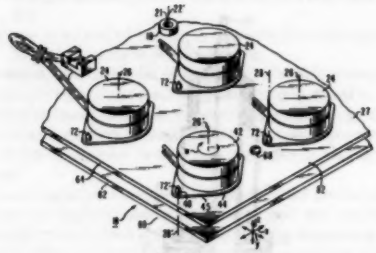
PALLET

John G. Aceti, Princeton Junction, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 22, 1984, Ser. No. 663,709

Int. Cl.[4] B65D *19/44*

U.S. Cl. 206—488 **10 Claims**



1. A pallet for releasably securing an array of workpieces in predetermined locations and orientations comprising:

first means including a member having a plurality of circular apertures and adapted to receive and locate each workpiece on a member surface in a predetermined location on a respective axis and in a predetermined angular orientation about the respective axis; and

second means secured in spaced relation to said first means including a resilient workpiece friction gripping means adjacent to each location and adapted to resiliently, releasably, and frictionally engage and hold the workpiece to said first means in said predetermined location and orientation upon the receiving of the workpiece by the first means;

each aperture serving as one of said predetermined locations, said member including an array of pins secured to a surface thereof, each pin corresponding to a different one of said apertures, each pin in a given radial position adjacent to the center of the corresponding aperture and adapted to engage a mating reference hole in the workpiece to be received and located in said corresponding aperture.

4,693,371

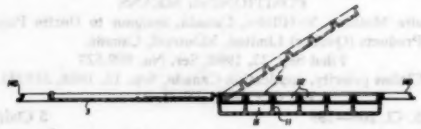
MEDICATION DISPENSER AND CONTAINER

Jack W. Malpass, Andover, N.J., assignor to Berlex Laboratories, Inc., Cedar Knolls, N.J.

Filed Nov. 16, 1981, Ser. No. 321,665

Int. Cl.[4] B65D *83/04*

U.S. Cl. 206—538 **23 Claims**



1. An apparatus for dispensing medical preparations comprising:

a tray having a plurality of dispensing means arranged in rows and columns with said dispensing means adapted for having placed thereinto medical preparations in predetermined amounts, and for containing and dispensing medical preparations respectively therefrom; and

display means respectively associated with each of said dispensing means for enclosing and displaying a sample of the medication to be placed in and dispensed from each of said dispensing means, whereby the possibility of locating

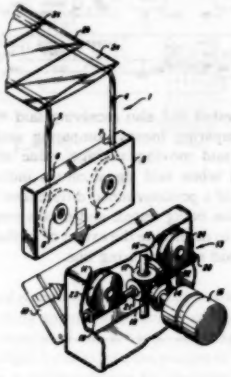
the wrong medication in a respective dispensing means is substantially reduced by comparision, with the sample medication located in the associated display means.

4,693,372

TAPED BAG CHAIN WITH CASSETTE

Ronan R. O'Neill, Varese, Italy, assignor to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed Dec. 9, 1985, Ser. No. 806,909
Claims priority, application United Kingdom, Jun. 14, 1985, 8515097
Int. Cl.[4] B65D *75/42*
U.S. Cl. 206—554 3 Claims



1. A bag chain comprising: a succession of imbricated bags; a pair of side-by-side spaced tapes each having an adhesive face; a cassette releasably mountable in a tape winding drive unit; a pair of tape-winding rotors in said cassette, each said rotor being attached to a respective one of the tapes and adapted for engagement with a respective tape winding drive shaft of the tape-winding drive unit to wind-up the tapes on the rotorsdrive and said tape-winding rotor having spaced apart substantially parallel axes of rotation.

4,693,373

SLIDE ARCHIVAL STORAGE AND RETRIEVAL SYSTEM

Owen L. Lamb, Scotts Valley, and William R. Maclay, Los Gatos, both of Calif., assignors to Slide Management Systems, Inc., Los Gatos, Calif.

Filed Jun. 12, 1985, Ser. No. 730,306
Int. Cl.[4] B07C *5/00*; G02B *27/02*; B65H *31/24*
U.S. Cl. 209—3.3 27 Claims

1. A slide sorter comprising:

a movable turntable having a plurality of slide receptacles thereon;

first means for holding a group of slides above said turntable, said first means including releasing means for releasing slides from said group one by one and delivering means for delivering one slide released from said group of slides to a position above said turntable;

second means including means for associating each slide in said group of slides with a previously derived accession number uniquely identifying each said slide, said second means further including means for deriving an updated accession number for said one slide that is delivered by said delivering means;

third means responsive to said second means for utilizing said updated accession number in accordance with a sorting algorithm to move said turntable to locate a particular slide receptacle relative to said position above said turntable; and

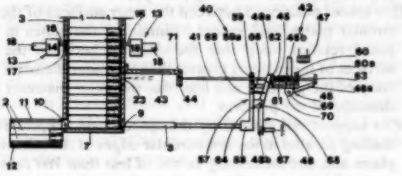
fourth means for activating said releasing means so that said one slide is delivered by said delivery means to said position above said turntable, and thence into said receptacle.

4,693,374

DEVICE FOR FEEDING CIGARETTES TO THE WRAPPING LINE OF A PACKETING MACHINE

Gastone Dall'Osso, Bologna, Italy, assignor to G.D. Societa per Azioni, Bologna, Italy

Filed Nov. 22, 1985, Ser. No. 801,145
Claims priority, application Italy, Dec. 6, 1984, 3648 A/84
Int. Cl.[4] B07C *5/344*
U.S. Cl. 209—535 16 Claims



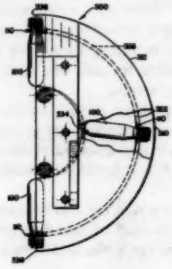
1. A device for feeding cigarettes to the wrapping line of a packeting machine, comprising a horizontal wall (7); a hopper (1) for feeding cigarettes (2) to said machine, said hopper (1) being divided into a plurality of outlet channels (5) each having a width substantially equal to the diameter of a cigarette (2), and through which the cigarettes (2) descend stepwise until they rest on said horizontal wall (7); a pusher element (8) operable between a first rest position and a second eject position, said second eject position, being spaced from said first rest position and within one of said outlet channels for pushing said cigarettes out of said hopper; sensor means (13) provided along at least one of said channels (5) for checking the cigarettes (2) in succession; and at least one discarding device (40) controlled by said sensor means (13) for removing defective cigarettes (2) from said hopper (1), said discarding device (40) being disposed, with respect to said hopper (1), between said sensor means (13) and said pusher element (8) and being provided, for each of said channels (5), with means (41) which engage, retain and extract the defective cigarettes (2) from said hopper (1) and which during extraction of defective cigarettes (2) are operable between a first and a second end position, said second end position being within at least a wall of said hopper (1); said means (41) being secured with said pusher element so as to be movable therewith.

4,693,375

PREFORM HANDLING APPARATUS

Karl D. Schweers, 22 Meridian Rd., Eatontown, N.J. 07724

Filed Nov. 22, 1985, Ser. No. 800,653
Int. Cl.[4] B07C 5/02; C03B 23/04
U.S. Cl. 209—544 15 Claims



13. Preform handling apparatus for orienting a plurality of preforms, each of said preforms having an outer diameter, an open end and a closed end, a threaded neck adjacent the open end, a shoulder adjacent the neck, and a body extending from the shoulder to the closed end and having an outer diameter, the outer diameter of the preform being largest at the shoulder, said preform handling apparatus being an inverter, said inverter comprising:

I. a frame;

II. two juxtaposed semicircular plates carried by the frame, each of said plates having a straight edge, a semicircular edge and an inner surface having a groove formed therein, each of said grooves extending parallel to the semicircular edge of the plate and said grooves being aligned to form a preform shoulder receiving passage;

III. a spacer positioned between the inner surfaces of the semicircular plates, said spacer maintaining the plates in juxtaposed relation such that the distance between the inner surfaces of the plates is greater than the outer diameter of the body of the preform and less than the outer diameter of the shoulder of the preform;

IV. a support rail carried by the spacer, said support rail extending parallel to the semicircular edges of the semicircular plates and circumscribing an arc of less than 180°, said support rail being at a distance from the preform shoulder receiving passage which distance is slightly less than the distance from the shoulder to the closed end of the preform;

wherein preforms fed into the inverter are received in the inverter such that the shoulder of the preform is received in the preform shoulder receiving passage and the open end of the preform is directed upwardly; and

wherein the preform travels through the inverter such that the shoulder of the preform travels through the preform shoulder receiving passage and the preform exits from the inverter having been rotated 180° with the open end of the preform directed downwardly.

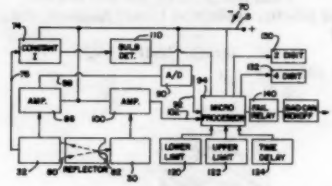
4,693,376

APPARATUS FOR INSPECTING CONTAINERS

Paul R. Marion, Chicago; James J. Nemcoes, Orland Park, and George C. Kolodziej, Oak Park, all of Ill., assignors to National Can Corporation, Chicago, Ill.

Filed May 26, 1981, Ser. No. 266,801
Int. Cl.[4] B07C 5/34
U.S. Cl. 209—552 8 Claims

1. An apparatus for inspecting the surface of articles in an article manufacturing line having an article surface processing station comprising an article presence sensing means for sensing the presence of an article at a selected location in said line; surface sensing means positioned adjacent said location for sensing the condition of at least a portion of the surface, said sensing of said portion of said article will indicate whether said article surface has been properly processed by providing signal means representative of the condition of said surface; computing means for determining a moving average value of said signal means from a preselected number of previously tested articles; comparing means receiving said signal means from



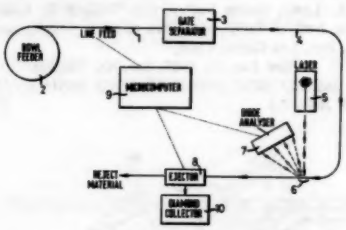
articles being tested and also receiving said moving average value, said comparing means comparing said signal means received with said moving average value and providing a selected output when said signal means indicates an article having a value of a predetermined differences from said moving average value being tested, and means responsive to said selected output to determine the extent of further processing of said article in said manufacturing line.

4,693,377

DIAMOND SEPARATION USING RAMAN SCATTERING

Donald L. Gerrard, Epsom; John E. Preedy, Bromley, and Kenneth P. J. Williams, Camberley, all of England, assignors to The British Petroleum Company p.l.c., London, England

Continuation of Ser. No. 611,740, May 18, 1984, abandoned. This application Aug. 27, 1986, Ser. No. 902,092
Claims priority, application United Kingdom, May 24, 1983, 8314340
Int. Cl.[4] B07C 5/342
U.S. Cl. 209—579 7 Claims



1. A method for the separation of diamonds from a diamond containing ore comprising the steps of (a) passing the ore through a separator capable of dividing the ore into discrete units (b) shining a beam of laser radiation of known frequency onto successive discrete units of ore (c) filtering the Raman scattered radiation reflected from each discrete unit of ore by means of a filter adapted to remove all radiation except that characteristic of diamond and (d) passing the filtered radiation into a detector, the detector being adapted to actuate a separator capable of separating the units of diamond containing ore from the units of non-diamond containing ore.

4,693,378

METHOD AND APPARATUS FOR SORTING ARTICLES

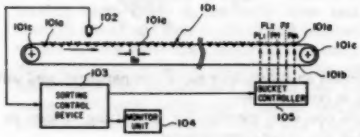
Osamu Azegami, Fuchu, and Toshifumi Miyake, Ohtsu, both of Japan, assignors to Kabushiki Kaisha Ishida Koki, Kyoto and Yac Co., Limited, Akishama, both of, Japan

Continuation of Ser. No. 474,334, Mar. 11, 1983, abandoned. This application Sep. 25, 1985, Ser. No. 779,619

Claims priority, application Japan, Mar. 13, 1982, 57-40069; Mar. 13, 1982, 57-40070; Mar. 13, 1982, 57-40071; Mar. 13, 1982, 57-39981; Mar. 13, 1982, 57-39982

Int. Cl.[4] B07C 5/10; G01B 11/28; H04N 7/02

U.S. Cl. 209—586 1 Claim



1. A method of computing the area and number of articles in an automatic sorting apparatus including an image pickup unit for producing images of the articles, an image memory for storing, as a multiplicity of pixels, the images of the articles one frame at a time, a sorting device for deriving the area of an imaged article from the number of pixels forming the article image and for comparing the area of the imaged article with a preset range of grades to produce selection information indicative of a particular grade to which the article belongs, and means for sorting out the article dependent on the size thereof according to the selection information, said method comprising the steps of:

(a) determining the black/white level of each pixel by raster scanning the pixels forming the image of the article and storing the starting and ending positions of a continuous black-level portion in an ith scanning step;

(b) determining whether a black-level portion in an (i+1)th scanning step is contiguous to the black-level portion in the ith scanning step by employing the stored starting and ending positions;

(c) adding the number of pixels of the black-level portion in the (i+1)th scanning step to the total number of pixels of the black-level portions in scanning steps up to the ith scanning step when the black-level portions in the ith and (i+1)th scanning steps are contiguous to each other, or separately storing the number of pixels of the black-level portion in the (i+1)th scanning step when the black-level portions in the ith and (i+1)th scanning steps are discontinuous from each other; and

(d) identifying the number of articles in one frame as being two when black-level portions in all scanning steps following the (i+1)th scanning step are discontinuous from the black-level portions in the ith and (i+1)th scanning steps, or adding the number of pixels of the black-level in a current scanning line to the total number of pixels in the ith and (i+1)th scanning steps when black-level portions in scanning steps following the (i+1)th scanning step and up to the current scanning line are contiguous to the black-level portions in the ith and (i+l)th scanning steps and identifying the number of articles in one frame as one, with the total number of pixels representing the area of the one article.

4,693,379

SCREENING APPARATUS

Wolfgang Stehle, Schlier, Fed. Rep. of Germany, assignor to Maschinenfabrik Bezner GmbH & Co. KG, Ravensburg, Fed. Rep. of Germany

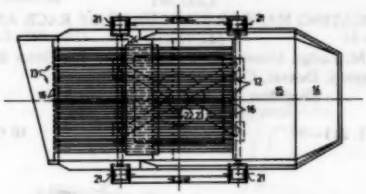
PCT No. PCT/EP85/00068, § 371 Date Oct. 23, 1985, § 102(e) Date Oct. 23, 1985, PCT Pub. No. WO85/03889, PCT Pub. Date Sep. 12, 1985

PCT Filed Feb. 23, 1985, Ser. No. 793,690

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1984, 3407460

Int. Cl.[4] B07B 1/12, 1/38, 1/46; C02F 11/00

U.S. Cl. 209—674 7 Claims



1. A screening apparatus, particularly for screening valuable materials, domestic garbage, industrial garbage, bulky garbage, dry garbage, wet garbage, compost and/or problematic and dangerous materials, comprising: inclined, open-ended bars capable of oscillatory movement arranged in a transport direction and forming at least two bar grating screens forming a stepped arrangement of bar grating with one screen located behind the other in the transport direction, wherein said bar grating screens (12,13) have bars (16) that are tapered in the transport direction; said apparatus further comprising: means forming an inlet portion (14) and a preliminary distributor path (15) for feeding in material upstream of at least the upper bar grating screen (12) of said stepped arrangement; a screen frame (11) accommodating said bar grating screens (12,13) and said means forming the inlet portion (14) and the preliminary distributor path (15), said inlet portion (14) and said preliminary distributor path (15) comprising approximately ⅓ of the entire length of said screening apparatus; rubber oscillating elements on which said screen frame (11) is mounted; and eccentric drive means (22,23) for causing said screen frame (11) to perform a circular oscillating movement with a large circular oscillating diameter of approximately 100 mm.

4,693,380

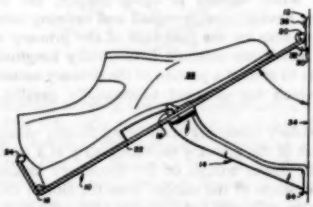
RACK SUPPORT

William Muth, Ocala, Fla., assignor to Clairson International, Ocala, Fla.

Continuation of Ser. No. 705,504, Feb. 25, 1985, abandoned. This application Dec. 19, 1986, Ser. No. 943,888

Int. Cl.[4] A47F 7/08

U.S. Cl. 211—35 8 Claims



1. An angled shelf support member comprised of a main body section having a longitudinal axis and integrally formed with upper and lower end sections, said lower end section

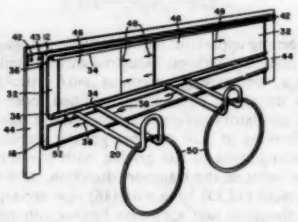
being positioned at an angle to said main body section and including an outwardly facing flat end surface positioned so as to extend perpendicularly across said lower end section, said upper end section including a front portion and opposite side portions, first means defining a first groove extending across the front portion of said upper end section so as to be parallel to said flat surface and second means defining a pair of spaced apart grooves, one extending along each of said opposite side portions of said upper end section, said pair of grooves extending perpendicularly to said first groove, with said pair of grooves being arranged at an angle with respect to said longitudinal axis.

4,693,381

FLOATING HANGER MERCHANDISE RACK AND METHOD

Edith M. Lodge, Denver, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Nov. 25, 1985, Ser. No. 801,356
Int. Cl.[4] A47F 5/08
U.S. Cl. 211—94 **10 Claims**



1. A rack for storage and display comprising:

a primary mounting strip having a face that is oriented toward a front side of the rack, the mounting strip having at least one edge that is shaped so as to form a trough having a U-shaped configuration when viewed in cross section, the trough having a predetermined depth and defining a substantially uniform slot on the face side of the mounting strip, which is oriented substantially longitudinally in relation to at least a portion of the mounting strip;

at least one hanger having a leg portion angled from an article carrying portion, the leg portion disposed in the slot and free to slide along in the slot, and adapted to keeping the article carrying portion oriented generally perpendicular to the face of the mounting strip, and is fabricated from a rigid material that forms a U-shaped configuration when the hanger is viewed from the front and a Z-shaped configuration when the hanger is viewed from the side;

a secondary mounting strip fixably mounted onto the face of the primary mounting strip, and having at least two edges that have been shaped so as to form upper and lower secondary troughs, which each have a U-shaped configuration when viewed in cross section, the secondary troughs having predetermined and defining substantially uniform slots on the face side of the primary mounting strip, which are oriented substantially longitudinally in relation to at least a portion of the primary mounting strip and which are oriented substantially parallel to each other;

the secondary mounting strip being fixably mounted onto the face of the primary mounting strip at a position such that the lower trough of the secondary mounting strip blocks escape of the hanger from the slot of the primary mounting strip while at the same time permitting substantially longitudinal movement of the hanger along in the slot of the primary mounting strip; and

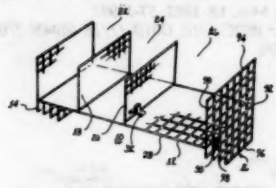
fastening means for fixably mounting the rack to a means for supporting the rack.

4,693,382

SORTER FOR AUTOMOTIVE GLOVE COMPARTMENTS

Neal Galen, 2115 W. Royal Palm Rd., Suite 1014, Phoenix, Ariz. 85021

Division of Ser. No. 797,930, Nov. 14, 1985. This application Aug. 4, 1986, Ser. No. 892,858
Int. Cl.[4] A47F 5/00
U.S. Cl. 211—189 **8 Claims**



1. A sorter for an automotive glove compartment, said sorter comprising in combination:

(a) at least one shelf member for supporting articles to be stored in the glove compartment;

(b) side members for supporting said shelf member within the glove compartment;

(c) each said shelf member and said side member being formed from a lattice like grid, said grid including rungs and junctions and wherein each said rung interconnects a pair of said junctions and wherein each said rung includes opposed tapered sections tapering toward a connected one of said junctions for defining the point of fracture of said rung adjacent each connected one of said junctions;

(d) means for detachably attaching said side members to said shelf member;

(e) at least one divider for segregating articles to be stored upon said shelf member; and

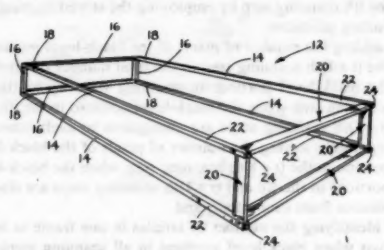
(f) further means for detachably attaching said divider to said shelf member.

4,693,383

MERCHANDISING RACK

Jay G. Fenwick, Albert Lea, Minn., assignor to Joyce International, Inc., Great Neck, N.Y.

Filed Apr. 12, 1985, Ser. No. 722,621
Int. Cl.[4] A47B 47/00
U.S. Cl. 211—192 **34 Claims**



1. A merchandising rack module usable in displaying a plurality of cigarette cartons, said merchandising rack module comprising:

a plurality of spaced, generally vertically oriented, hollow, uprights having a plurality of generally rectangular spaced slots in wall surfaces thereof;

a plurality of elongate tie braces, each of said tie braces extending generally horizontally between two of said spaced uprights, each of said tie braces having a locking blade slidably carried in an inner sleeve positioned within

said tie brace adjacent an end of said tie brace, each said locking blade having a locking blade head at a first end and being supported for movement with respect to said inner sleeve in said tie brace by a rotatable elongate locking blade actuator rod having a longitudinal axis perpindicular to the longitudinal axis of the tie brace, said actuator rod comprising an intermediate portion and two end portions, each of the portions having a substantially similar cross-sectional configuration, said intermediate portion of said actuator rod being offset from the longitudinal axis of said rod, the actuator rod further having slotted head portions positioned adjacent outer surfaces of said tie brace, said intermediate offset portion passing through a journal portion in a second end of said locking blade, rotation of said slotted head portion of said actuator rod causing said locking blade to slide with respect to said end of said tie brace and said upright, whereby each of said locking blade heads is insertable from said tie brace through one of said slots in one of said wall surfaces, each of said locking blade head receiving slots being T-shaped, each said tie brace further including at least one T-shaped tab at each end thereof, said at least one T-shaped tab being positionable within said T-shaped slot, said locking blade head being insertable within said T-shaped slot in conjunction with said T-shaped tab to lock said tie brace end in said upright;

a plurality of base plates, each of said base plates extending generally horizontally between two of said uprights, said uprights, tie braces and base plates cooperating to define said merchandising rack module;

a plurality of shelves removably secured and adjustably positioned between said plurality of uprights and providing support surfaces for the cartons of cigarettes; and

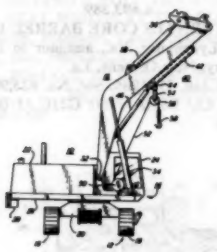
means for separating and retaining cartons of cigarettes on said shelves.

4,693,384

EXCAVATOR BOOM DERRICK

Charles P. Gilmore, Jr., Ash Flat, Ark., assignor to Gilmore Transportation Services, Inc., Houston, Tex.

Filed Dec. 20, 1985, Ser. No. 811,958
Int. Cl.[4] B66C *23/56*
U.S. Cl. 212—257 **5 Claims**



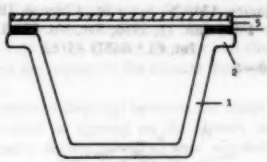
1. A heavy duty excavator having a mobile undercarriage and an overcarriage rotatably mounted upon the undercarriage, said excavator further including a boom pivotally mounted at its proximal end in the overcarriage, a first hydraulic means acting between the overcarriage and the boom for raising and lowering the boom in an ar, rail means secured to the underside of the boom, a trolley movably mounted upon said rail means for movement thereover, a second hydraulic means acting between the boom and the trolley for driving the trolley back and forth over the rail means, a sheave mounted upon said trolley, a winch mounted upon said overcarriage, a cable means wound about the winch and having a free end passing through said sheave whereby the free end of the cable can be attached to a load, a quick disconnect shoe mounted in a pivot at the distal end of the boom, and a third hydraulic means acting between the shoe and the boom for moving the shoe about said pivot whereby a stick mounted tool connected to the shoe can be selectively positioned.

4,693,385

STERILIZATION-RESISTANT GLASS CONTAINER SEALED WITH AN ALUMINUM COMPOSITE FILM

Alfons Lamping, Corminboeuf, and Beat Karth, Oberönz, both of Switzerland, assignors to Nyffeler Corti, Kirchberg BE, Switzerland

Filed May 6, 1985, Ser. No. 731,088
Claims priority, application Fed. Rep. of Germany, May 7, 1984, 3416754
Int. Cl.[4] B65D *51/00*
U.S. Cl. 215—232 **14 Claims**



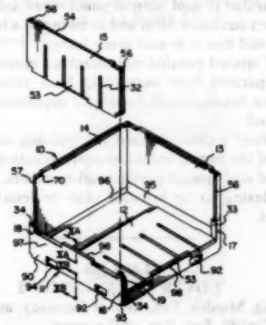
1. A sterilization-resistant, heat sealed glass container which comprises, as a closing membrane, an aluminum/polypropylene composite film sealed to a thermoplastic coating of a baking varnish provided on the rim of the glass container.

4,693,386

COLLAPSIBLE SHIPPING CONTAINER

Larry R. Hughes, Lindsay; Michael L. Dorsey, Sunderland, and David Wensley, Lindsay, all of Canada, assignors to Bonar Rosedale Plastics Ltd., Markham, Canada

Filed Jan. 21, 1986, Ser. No. 820,777
Claims priority, application Canada, Jan. 22, 1985, 472570
Int. Cl.[4] B65D *7/24*
U.S. Cl. 220—1.5 **17 Claims**



1. A collapsible shipping container comprising: a rectangular base, and four side walls each attached at a respective side of the base and capable of only pivotal movement on a horizontal axis parallel to that side, each wall being pivotable between an upright position, wherein it extends normal to the base, and a retracted position wherein it overlies the base, the container being adjustable from an erected condition, wherein all four walls are in the upright position, to a collapsed condition wherein all four walls are in the retracted position, the adjacent edges of neighboring walls being configured to provide mutual

support when in the upright position, said walls carrying captive releasable fastener means that engage between neighboring walls to lock them in the upright position, said fastener means comprising a latch pin and a parallel mounting pin fixedly interconnected by a transverse strap, said mounting pin being axially movably carried in an edge region of one wall whereby the latch pin is selectively insertable axially in a direction generally parallel to said adjacent edge into a socket in an adjacent wall to secure said walls together in the upright position with said latch pins and mounting pins extending in a generally upright orientations on axes normal to any horizontally directed separation forces applied to said walls, there being an auxiliary socket in the wall in which the mounting pin is carried, said auxiliary socket receiving said latch pin in a non-operative stored condition.

4,693,387

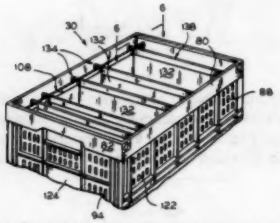
FOLDABLE BOX FOR HANGING FILES

Russ W. Stonier, 1340 N. Astor St., Chicago, Ill. 60610

Filed Jun. 11, 1986, Ser. No. 872,829

Int. Cl.[4] B65D *85/62*

U.S. Cl. 220—6 **17 Claims**



1. A collapsible box for supporting and holding hanging files having hooks projecting from upper corners thereof, said box comprising:

four sides and a bottom panel interconnected to form a generally rectangular shape; a first two of said sides being hinged to fold onto the bottom panel to provide a compact structure form and to fold into an upright and erect box;

the other two of said sides being hinged to swing to a position parallel to said bottom panel when said box is in said compact structure form and to swing to a locking position when said box is in said erect form;

a pair of spaced parallel rail members mounted in the box and separated from each other by a distance equal to a distance between said hooks for supporting the hanging files; and

at least four sockets formed in opposing and confronting sides of the box at locations corresponding to at least the ends of said spaced parallel rail members, said rail members flexing to be installed into or removed from said sockets.

4,693,388

COVER ARRANGEMENT

Kurt Hennig, Munich, Fed. Rep. of Germany, assignor to Gebr. Hennig GmbH, Fed. Rep. of Germany

Filed Jun. 16, 1986, Ser. No. 874,442

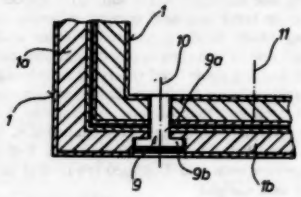
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1985, 3522887

Int. Cl.[4] B65D *8/14*

U.S. Cl. 220—8 **6 Claims**

1. A cover assembly for industrial equipment and the like comprising at least two cover elements (1, 1') with walls which overlap one another and which are telescopically movable relative to one another, and connector means for holding the overlapped walls of the cover elements together in sliding relationship and for guiding the movements of the cover elements with respect to each other, the improvement therein of said connector means comprising

the overlapped wall of one of said cover elements (1) including at least one elongated groove (5) formed in said wall with the length of said groove extending in the directions of the relative movements of the cover elements, said groove comprising a first relatively narrow elongated slot openings (5*a*) formed through the outer surface of said wall and facing the adjacent cover element (1') and an internal relatively wider portion (5*b*) formed internally of the wall and overlapping said narrow width portion, and an opening (8) formed through the other outer surface of said wall and facing away from said adjacent cover element (1'),



the adjacent overlapped wall of said other cover element (1') defining an opening therein aligned with the groove of said first cover element, and

a guide element (9) including a stem (9*a*) inserted into the opening of the adjacent wall of said other cover element and extending through the relatively narrow width portion of said groove and including an enlarged head (9*b*) of a breadth larger than the narrow width portion of said grove positioned in the internal portion of said groove,

so that when the cover elements are moved relative to one another the guide element slides along the length of the groove and the narrow portion of the groove captures the head of the guide element and access is provided to the guide element when the opening of the other outer layer of the wall of said one cover element is aligned with the connector.

4,693,389

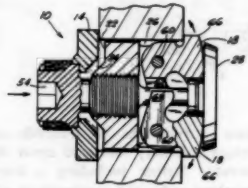
REACTOR INTERNALS CORE BARREL HOLE PLUG

David D. Kalen, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jan. 31, 1986, Ser. No. 823,905

Int. Cl.[4] B65D *53/00*; G21C *13/00*

U.S. Cl. 220—236 **6 Claims**



1. A plug for insertion into reactor core barrel holes, comprising:

a. a plug body having inner and outer ends, said plug body being of a size to closely fit the hole to be plugged and having a rectangular bore adjacent its inner end and a substantially cylindrical bore along its longitudinal axis at its outer end in communication with said rectangular bore;

b. a flange sized larger than the hole to be plugged attached to said plug body and having pins mounted thereon for

slidably receiving said plug body adjacent the outer end of said plug body to limit the movement. of said plug body into the hole to be plugged, said flange being contoured to the surface of the core barrel to be plugged;

c. a pawl pivotally mounted in said rectangular bore and moveable between first retracted release position and a second extended locking position; and

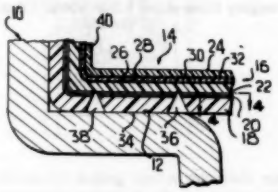
d. an actuator screw threadably engaged in said cylindrical bore and in communication with said rectangular bore and having a cam in communication with said pawl for moving said pawl between said first and second positions.

4,693,390

LID FOR A PLASTIC CONTAINER

Ihab M. Hekal, Stamford, Conn., assignor to Continental Can Company, Inc., Norwalk, Conn.

Filed Oct. 15, 1986, Ser. No. 919,051
Int. Cl.[4] B65D *41/00*
U.S. Cl. 220—359 **25 Claims**



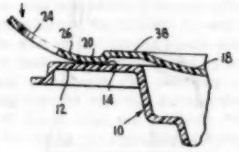
12. A lid for a plastic container, said lid comprising a barrier laminate, a base layer forming means for bonding said lid to a container, an adhesive layer between said base layer and said barrier laminate, and score line means in and through said base layer defining an area of said base layer to be permanently bonded to a container and to be peeled from the remainder of said lid.

4,693,391

CLOSURE HAVING A PULL TAB AND A CONTROLLED SEAL WIDTH AT THE PULL TAB

Donald J. Roth, Westport, Conn., assignor to Continental Can Company, Inc., Norwalk, Conn.

Filed Oct. 23, 1986, Ser. No. 922,340
Int. Cl.[4] B65D *41/00*
U.S. Cl. 220—359 **7 Claims**



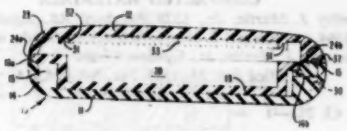
1. A closure, said closure being of the type constructed to have a rupturable bonded seal with a container and including a projecting pull tab for effecting removal of said closure, said pull tab having a radial axis, said closure being circular in outline at least at said pull tab, and said closure in alignment with said pull tab and radially inwardly of said pull tab being upwardly offset to change a configuration of a bonding surface of said closure from circular to angular to reduce an effective width of said bonding surface transversely of said pull tab axis and thus a peeling force required to remove said closure.

4,693,392

HINGE, AND BOSS ASSEMBLY FOR CLOSURE MEMBERS

Joseph P. Contreras, Sr., 6 Brockden Dr., Mendham, N.J. 07945

Filed Sep. 15, 1986, Ser. No. 907,483
Int. Cl.[4] B65D *43/14, 51/04*
U.S. Cl. 220—343 **26 Claims**



1. A concealed latch assembly for a closure member pivotally connected to a base member and movable from a closed position to a full open position and vice versa comprising,

a. spaced hinge means including, hinge elements connected respectively to the closure member and the base member to permit movement of the closure member to a full open position,

b. a boss member disposed between the hinge means so that a force must be exerted on the closure member during compressive forces on the closure member and the base member,

c. said boss member made of a material generally harder than the material for the closure member and the base member; and

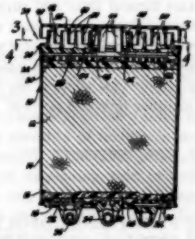
d. the boss member alternatively and selectively sized and shaped to provide a predetermined range of resiliency from rigid and non-yielding to readily flexible as required for movement of the closure member from closed position to a full open position and vice versa.

4,693,393

FUEL VAPOR STORAGE CANISTER HAVING TORTUOUS VENT PASSAGE

Chris M. DeMinco, West Rush; Martin J. Field, Churchville, and Richard K. Judd, Rochester, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 849,807, Apr. 9, 1986, abandoned. This application Oct. 10, 1986, Ser. No. 917,672
Int. Cl.[4] B65D *51/16*
U.S. Cl. 220—374 **2 Claims**



1. A fuel vapor storage canister comprising a housing having a bed of material adapted to absorb fuel vapor, an inner cover having a base closing one end of said housing, said base having a central aperture for air flow into said bed, said inner cover further having a plurality of concentric barriers surrounding said aperture and projecting outwardly from said base, an outer cover supported on said inner cover, said outer cover having a roof and a plurality of concentric barriers projecting inwardly from said roof, said outer cover barriers being interleaved with said inner cover barriers to define a labyrinthine

passage for air flow to said aperture, said covers thereby inhibiting the passage of water and dust to said aperture.

4,693,394

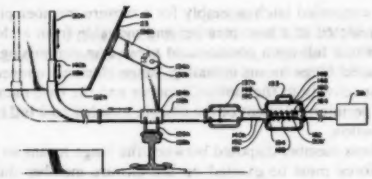
APPARATUS AND METHODS FOR DISPENSING COMPACTED MATERIALS

Timothy J. Martin, Jr., 1328 Pangborn Rd., Lynden, Wash. 98264, and Richard T. Henry, Bellingham, Wash., assignors to Timothy J. Martin, Jr., Lynden, Wash.

Filed Jan. 24, 1985, Ser. No. 694,414

Int. Cl.[4] B65G *69/06*

U.S. Cl. 222—1 **12 Claims**



1. Apparatus for loosening particulate material contained in a container, said apparatus comprising:

a. a flexible tubular member in fluid communication with a fluid source, a first end portion of said flexible tubular member located inside said container, second end portion of said flexible tubular member located outside of said container;

b. a support member jacketing said flexible tubular member substantially along the length thereof, a first end portion of said support member providing lateral support for said flexible tubular member first end portion along the longitudinal axis thereof, said support member having lateral flexibility along the longitudinal axis thereof which is less than that of said flexible tubular member, said flexible tubular member slidable within said support member to permit axial movement of said support member and said flexible tubular member relative to each other along the longitudinal axes thereof to expose selected lengths of said flexible tubular member first end portion; and

c. a sleeve member jacketing said support member, said sleeve member having less lateral flexibility along the longitudinal axis thereof than said support member, said support member slidable within said sleeve member to permit axial movement of said support member relative to said sleeve member along the longitudinal axis of said sleeve member to provide support for selected lengths of said support member first end portion.

4,693,395

ETHYLENE PROPYLENE COPOLYMER IN A SUBSTRATE AND COLLAPSIBLE DISPENSING CONTAINER MADE THEREFROM

Edward A. Tavss, Kendall Park; John Santalucia, East Brunswick, and David L. Carroll, Piscataway, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 687,281, Dec. 28, 1984, abandoned. This application Sep. 2, 1986, Ser. No. 902,119

Int. Cl.[4] B65D *35/08*

U.S. Cl. 222—107 **10 Claims**

6. A collapsible paste dispensing container of layers of material having low percentage flavor absorption characteristics of 4.8% comprising a first innermost layer of an ethylene propylene copolymer, a second layer of metal foil, a third layer of paper and an outermost fourth layer of an ethylene propylene

copolymer which is thicker than the first layer, and has a thickness ranging from about 3.5 to about 5.0 mils.

4,693,396

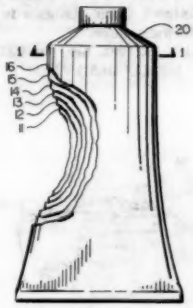
LAMINATE SUBSTRATE AND ARTICLE THEREFROM INCORPORATING FLUORINATED POLYETHYLENE

Edward A. Tavss, Kendall Park, N.J.; Samuel Temin, Needham, Mass.; John Santalucia, East Brunswick, and Davis L. Carroll, Piscataway, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 687,561, Dec. 28, 1984, abandoned. This application Sep. 2, 1986, Ser. No. 902,120

Int. Cl.[4] B65D *35/08*

U.S. Cl. 222—107 **10 Claims**



6. A collapsible paste dispensing container of layers of materials having low flavor percentage absorption characteristics of 2.6% comprising a first innermost layer of fluorinated polyethylene of a thickness range of from about 0.5 to about 3.0 mils, a second layer of metal foil of a thickness range of from about 0.5 to 2.0 mils, a third layer of paper of a thickness range of from about 1.5 to about 2.5 mils, and an outermost fourth layer of a fluorinated polyethylene which is thicker than said first on layer and ranges from about 3.5 to about 5.0 mils in thickness.

4,693,397

DOSING DEVICES FOR VISCOUS MATERIALS PARTICULARLY HIGHLY VISCOUS MATERIALS

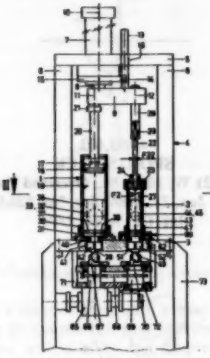
Hans-Jörg Lang, Biberbach, Fed. Rep. of Germany, assignor to Ludwig Schwerdtel GmbH, Fed. Rep. of Germany

Filed Jul. 25, 1984, Ser. No. 634,281

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1983, 3327420

Int. Cl.[4] B67D 5/52

U.S. Cl. 222—137 **4 Claims**



1. A dosing device for dosing viscous materials, particularly highly viscous materials, including a dosing cylinder for a main material and at least one dosing cylinder for an additive to be dosed in an in each case fixed but variable volume ratio with respect to the main material, with a pressure feeding of the main material and additive into the dosing cylinders, each dosing cylinder containing a drivable dosing piston, a common drive and said dosing pistons being arranged on a common frame, a respective supply connection issuing into each dosing cylinder and a respective outlet connection issuing therefrom, each of said connections being openable or closable by means of a respective two-way valve, said dosing cylinders being arranged substantially parallel to one another, the dosing pistons of said dosing cylinders being drivable with an identical stroke and the dosing piston of the at least one additive dosing cylinder being contructed as a plunger with a smaller cross-section than the cross-section of the dosing cylinder for said main material and the plunger being sealingly guided in an interchangeable guide bush of said additive dosing cylinder, said at least one additive dosing cylinder being connected as a sub-assembly in an interchangeable manner by means of a rapidly connectable and releasable coupling to said frame, the dosing piston of the cylinder for said main material and the plunger of said at least one additive dosing cylinder engaging with a cross-beam which is displaceable by said drive parallel to itself along the axes of said dosing piston and plunger, the plunger of said at least one additive dosing cylinder not being connected to said cross-beam, the two-way valve being a cone-plug forming one unit with said additive dosing cylinder, said cone-plug of the at least one additive dosing cylinder being connected by means of a detachable coupling to a rotary drive.

4,693,398

DISPENSING CONTAINER

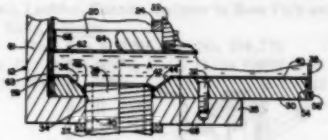
Klaus-Wilhelm Voss, and Werner Kluj, both c/o Vosschemie GmbH, Esinger Steinweg 50, Postfach 1355, 2082 Uetersen - Bei Hamburg, Fed. Rep. of Germany

Filed Jun. 22, 1981, Ser. No. 275,728

Int. Cl.[4] B67D 5/54

U.S. Cl. 222—327 **4 Claims**

1. In combination with a dispensing container which comprises an annular side wall and a lower end wall closing a lower end of the side wall, the lower end wall being spaced upwardly of a lower edge of the side wall, there being a discharge opening in the lower end wall spaced a selected distance from a center of the lower end wall, a frame, a support member mounted on the frame and received in the space inside a lower end portion of the side wall, there being a space below the lower end wall and inside the lower end portion of the side



wall for receiving the support member, means for keying the discharge opening to an opening in the support member, a pipe member mounted in the frame and extending through the opening in the support member, the opening in the support member being a distance from the center of the support member equal to the selected distance, and means for urging contents of the container downwardly, the pipe member receiving contents of the container.

4,693,399

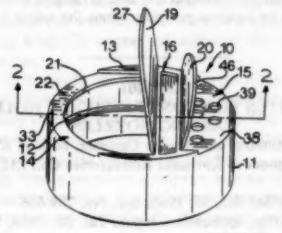
TWO-FLAP CLOSURE

John R. Hickman, Talmadge, and Craig C. Weidman, Wooster, both of Ohio, assignors to Weatherchem Corporation, Twinsburg, Ohio

Filed Oct. 17, 1986, Ser. No. 920,566

Int. Cl.[4] A47G 19/24

U.S. Cl. 222—480 **15 Claims**



1. A two-mode dispensing cap for a container comprising an injection-molded thermoplastic one-piece body, the body having a generally circular end wall, the end wall having a spoon dispensing side and a shake dispensing side, the shake dispensing side including a plurality of relatively small apertures for dispensing therethrough a pourable product carried in the container, the spoon dispensing side including a relatively large aperture of a size sufficient for allowing passage of a spoon therethrough for spooning out product, each of said sides having an associated hinged flap, the flap of the shake side being arranged to selectively close relatively small apertures, the flap of the spoon side being arranged to selectively close said relatively large aperture, the spoon flap having a free edge defining with the line of the associated hinge substantially the full boundary of the spoon flap, the spoon flap including catch means spaced along a line adjacent its free edge, the catch means being arranged to releasably secure the spoon flap in a closed position relative to the spoon aperture and extending along said adjacent line a distance substantially at least as great as one-half of the length of the free edge whereby the Flap is uniformly retained along its free edge.

4,693,400

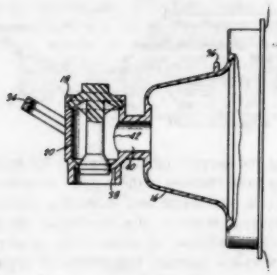
EXTENDABLE-NESTABLE DISPENSING APPARATUS

Carl E. Frahm, 1428 Oak Meadow Rd., and B. Joseph Rokus, 1420 Oak Meadow Rd., both of Arcadia, Calif. 91006

Filed Aug. 26, 1985, Ser. No. 769,570

Int. Cl.[4] B67D *3/00*; B65D *47/30*

U.S. Cl. 222—518 **4 Claims**



3. An apparatus for dispensing fluid from a container which comprises a selectively-operable dispensing valve in fluid communication with the container, means defining a cavity of sufficient size to allow said dispensing valve to nest inside the cavity, means for mounting the dispensing apparatus to a wall of the container, a flexible-extendable member interconnecting said mounting means and said valve, and a pulling tab for selectively moving the dispensing valve between a nested position in said cavity and an extended position outwardly from said cavity, said pulling tab having a first end attached to the valve and a second end which is movable between a first position for pulling the valve and a second position for locking the valve, and locking means extending from the flexible-extendable member constructed and arranged to engage the pulling tab in its locking position when the valve is nested in the cavity.

4,693,401

APPARATUS FOR COMPRESSIVELY HOLDING CASTING NOZZLES

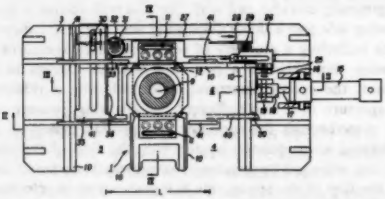
Takahiro Nishimura, and Masao Ohnuma, both of Kitakyushu, Japan, assignors to Kurosaki Refractories Co., Ltd., Kitakyushu, Japan

Filed Jul. 26, 1985, Ser. No. 759,638

Claims priority, application Japan, Jul. 28, 1984, 59-158285; Aug. 24, 1984, 59-177304

Int. Cl.[4] B22D *37/00*

U.S. Cl. 222—607 **10 Claims**



1. An apparatus for holding a casting nozzle against a device for controlling the rate of flow of molten metal comprising, a holder frame fixed to the bottom of said device and defining a casting nozzle travel passageway, a compressive holder disposed in said casting nozzle travel passageway for holding the casting nozzle, a spring box means on said holder having outer side portions resiliently supported by springs on opposite sides of said holder frame and rigidly connected to inner side portions provided with guide rail means forming a part of said passageway located beneath said device, a nozzle moving means mounted on said holder frame for moving the casting nozzle along said guide rail means, and a lifting means for causing the lifting of the casting nozzle against said device by said spring box means in response to movement of the casting nozzle along said guide rail means to fittingly hold said casting nozzle against said device.

4,693,402

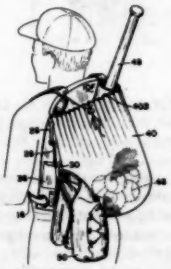
SPORTS PACK

Perry Comeau, 7821 W. 100th St., Overland Park, Kans. 66212

Filed Jan. 21, 1986, Ser. No. 820,014

Int. Cl.[4] A45F *3/04*

U.S. Cl. 224—215 **4 Claims**



1. A pack for wearing on the back of a user for carrying sport equipment, the pack comprising;

a back portion of flexible material having a front and back surface and being configured and dimensioned to be received on the back of the user with the front surface in contact with the user, the back portion having an upper edge, a lower edge, a right side edge and a left side edge, and having a first opening therein adjacent the lower edge and right side edge and a second opening therein adjacent the lower edge and left side edge;

a left shoulder strap and a right shoulder strap, each strap being attached at one end to said back portion upper edge, the right shoulder strap extending forwardly of said back portion and through said first opening and the left shoulder strap extending forwardly of said back portion and through said second opening, the other ends of the straps being attachable to each other in front of the user;

a generally tubular, elongated member affixed to the said back surface of said back portion and extending diagonally across said back portion, the tubular member being open at the top and closed at the bottom and adapted to receive an elongated sports item therein, such as a baseball bat, hockey stick, tennis racket and the like;

a second generally tubular member affixed to said back surface of said back portion and extending diagonally at an angle to said first mentioned tubular member and being of length less than said first mentioned tubular member; and

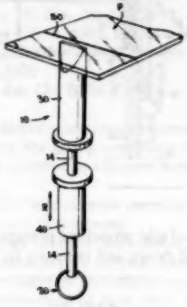
a sack member of flexible material secured to said back portion back surface and being open in the top and adaptable to receive balls and other playing equipment therein.

4,693,403

GLASS BREAKING TOOL

Michael L. Sprouse, 6304 Woodley Rd., Clinton, Md. 20735

Filed Dec. 31, 1985, Ser. No. 815,017
Int. Cl.[4] C03B *33/02*
U.S. Cl. 225—2 6 Claims



1. A method of breaking glass along a score line, comprising the steps of:

(a) providing a sheet of glass with a score line;

(b) providing an instrument; said instrument having: (1) a first member with a blunt end adapted to contact said sheet of glass; (2) a guiding means connected to said first member; (3) a second member moveable along said guiding means into striking engagement with said first member;

(c) positioning said blunt end of said instrument against said sheet of glass at a location opposite said score line;

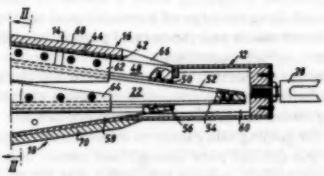
(d) moving said second member into striking engagement with said first member, transmitting force to asid blunt end and thence to said sheet of glass, causing breaking of said sheet of glass in the vicinity of said score line.

4,693,404

MAINS BURSTING TOOL

Malcolm Wayman, Darras Hall, and Geoffrey I. Mood, Whitley Bay, both of England, assignors to British Gas Corporation, England

Filed Dec. 18, 1985, Ser. No. 810,245
Claims priority, application United Kingdom, Jan. 10, 1985, 8500565; Feb. 27, 1985, 8505093; May 8, 1985, 8511646
Int. Cl.[4] B23P *17/02;* B26F *3/00*
U.S. Cl. 225—103 8 Claims



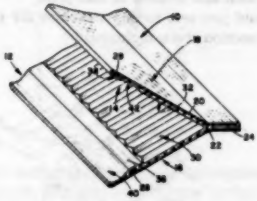
1. A main bursting tool comprising a body having an elongated shape having a leading end and including a tapered portion which tapers towards said leading end, said body comprising a side-wall assembly partly defining said shape, said assembly comprising in said tapered portion two mutually complementary wall parts together totalling the entire circumferential extent of the tapered portion, at least one of said two parts being a movable part capable of rectilinear reciprocation so as to expand and contract said tapered portion, said at least one movable part having surfaces remaining in close relationship with adjacent surfaces on said assembly notwithstanding said reciprocation, and said tool further comprising operating means comprising hydraulic cylinder means operable to effect said reciprocation, said operating means being supported by said body in a relationship which relieves said hydraulic cylinder means of side and bending loads.

4,693,405

THREADING BELT FOR PULP FLOATER DRYERS

Serge Masse, Lachine, Canada, assignor to Ross Pulp and Paper Inc., La Salle, Canada

Filed Feb. 7, 1985, Ser. No. 699,379
Int. Cl.[4] B65H *20/06;* F26B *13/10;* G03B *1/56*
U.S. Cl. 226—91 12 Claims



1. A paper pulp web threading system comprising:

(a) a threading belt for selectively conveying a paper pulp web therewith, the threading belt including:

a main strength member extending longitudinally adjacent a first longitudinal edge of the belt, said main strength member comprising woven synthetic fibers having high tensile strength and minimal elastic stretch;

a polymeric material encompassing the main strength member to form a hermetic seal therearound, the polymeric material defining a pair of gripping portions for gripping the web therebetween, the gripping portions being hingedly connected adjacent the main strength member;

a pair of matingly interengaging lip portions wherein each lip portion includes a tensile member extending longitudinally therethrough and each lip portion is operatively connected with one of the gripping portions adjacent a second longitudinal edge of the belt;

said lip tensile members comprise woven synthetic fibers embedded within the polymeric material, the woven fibers being longitudinally stretchable yet having high tensile strength; and,

said lip tensile members being capable of at least 8% elastic stretch;

(b) guide rollers for guiding the threading belt along a preselected workpath;

(c) a loading station disposed along the workpath for selectively loading the web between the belt gripping portions;

(d) a pulp web dryer disposed along the workpath downstream from the loading station; and,

(e) an unloading station disposed downstream from the dryer for removing the web from the threading belt.

4,693,406

RIVET TOOL HAVING REVERSIBLE ANVIL

Alan Bartholomew; Harold Bauer, both of Newton, Kans.; Loren E. Berry, Rothschild, Wis., and Glen Ediger, Newton, Kans., assignors to Center Industries Corporation, Wichita, Kans.

Division of Ser. No. 701,692, Feb. 14, 1987, Pat. No. 4,602,414.
This application Jun. 4, 1986, Ser. No. 850,052
Int. Cl.[4] B25C *11/00*
U.S. Cl. 227—63 1 Claim

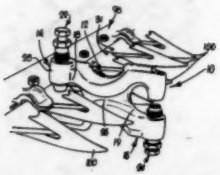
1. A hand tool for removal and replacement of double sickle section rivets, comprising:

a handle having fore and aft ends and presenting a pair of opposed side faces;

two working jaw sets respectively extending in generally opposite directions from said fore and aft ends of said handle, each of said jaws cooperatively presenting a generally C-shaped configuration and open, sickle section-receiving mouth, said mouths being in general horizontal alignment with each other;

means for permitting movement of said working jaw sets between a pair of adjacent, juxtaposed double-sickle sections for operable access to said sickle section rivets, said movement-permitting means comprising walls defining an elongated, fore and aft extending groove in said opposed side faces of said handle portion and in horizontal alignment with said mouths of said jaws;

one of said jaw sets having structure for replacement of a sickle section rivet, including



structure defining a bore in one of said jaws;

an elongated anvil bar having opposed end faces and configured for removable insertion into said bore, said end faces respectively including structure for alternately receiving different types of sickle section rivet heads; and

means carried by the other of said jaws for cooperatively engaging and closing the end of a sickle section rivet remote from said anvil;

the other of said jaw sets having structure for replacement of a sickle section rivet, including

structure defining a bore in one of said jaws; and

means carried by the other of said jaws for cooperatively engaging and pressing the rivet from the sickle and into said bore.

4,693,407

POWER IMPACT DEVICE, PARTICULARLY FOR FASTENERS

Manfred Buck, Nürtingen; Siegfried Fehrle, Leinfelden-Echterdingen; Martin Hölzel, Stuttgart; Wilfried Kabatnik, Leinfelden; Wolfgang Schmid, Filderstadt, and Karl Wanner, Leinfelden-Echterdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

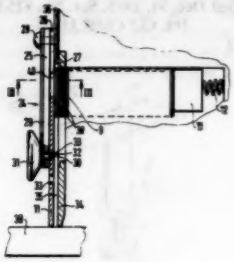
Filed Jul. 1, 1986, Ser. No. 880,915

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1985, 3533840

Int. Cl.[4] **B25C** *5/06, 5/15*

U.S. Cl. 227—109 **20 Claims**

1. A power impact device, particularly for fasteners, comprising means forming a propelling passage; a driver movable in said propelling passage; a magazine for fasteners and crossing said propelling passage; and an abutment arranged for positioning a set of fasteners for separating a frontmost fastener by said driver, said abutment being formed so that only a part of the cross-section of the set of fasteners is supported and so that it is displaceable relative to said propelling passage, said driver having a cross-section which deviates from a cross-section of said propelling passage over a fit tolerance so as to



allow narrowing of said propelling passage without preventing movement of said driver and reducing its thickness.

4,693,408

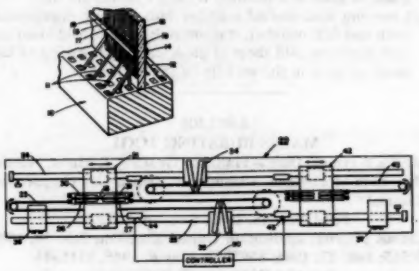
APPARATUS FOR BONDING CONNECTOR TERMINALS TO CIRCUIT BOARDS

David R. Dines, Oklahoma City, and Vertis C. Webb, Shawnee, both of Okla., assignors to American Telephone and Telegraph, Company AT&T Technologies, Inc., Berkeley Heights, N.J.

Division of Ser. No. 701,461, Feb. 14, 1985, Pat. No. 4,653,682. This application May 2, 1986, Ser. No. 858,663

Int. Cl.[4] **B23K** *31/02*

U.S. Cl. 228—47 **10 Claims**



1. An apparatus for reflowing solder to bond a series of spaced terminals projecting from a connector onto contact pads located along the edge of a circuit board where either or both of the terminals and the contact pads have solder deposited thereon, which comprises:

a carrier for supporting the circuit board and the connector with its terminals overlaying the contact pads;

heating means for projecting a stream of hot air;

means for guiding said carrier to move the overlaying terminals and contact pads through said stream of hot air;

means for initially moving the carrier past the stream of hot air at a fast rate in a first direction to preheat the overlaying terminals, the contact pads and the solder to a temperature below the reflow temperature of the solder and for returning the carrier at a slow rate in a second opposite direction past the stream of hot air to apply sufficient heat to the solder to reflow and solder bond the terminals to the contact pads; and

means for engaging and holding the connector terminals in overlaying position with the contact pads during the moving and returning of the carrier past the stream of hot air.

4,693,409

METHOD FOR DIRECTLY BONDING CERAMIC AND METAL MEMBERS AND LAMINATED BODY OF THE SAME

Nobuyuki Mizunoya; Hajime Kohama, and Yasuyuki Sugiura, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 507,004, Jun. 23, 1983, abandoned. This application Feb. 4, 1985, Ser. No. 697,874

Claims priority, application Japan, Jun. 29, 1982, 57-112401; Jun. 29, 1982, 57-112402

Int. Cl.[4] B23K *35/368*

U.S. Cl. 228—122 4 Claims

1. A method for directly bonding a nonoxide-type ceramic member selected from the group consisting of nitride ceramic member and carbide member to a copper member, comprising the steps of:

oxidizing a surface of said ceramic member to form an oxide layer 20 μm or less in thickness,

bringing said copper member into contact with the oxide layer of said nonoxide-type ceramic member, and

heating said copper member and said nonoxide-type ceramic member at a temperature of from 1065° to 1083° C. in an inert gas atmosphere to directly bond said copper member to said nonoxide-type ceramic member.

4,693,410

DRINKING CUP WITH CLOSURE FOR OPEN BOTTLES AND/OR CANS

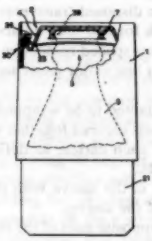
Aloiz Selz, Freiburg, Fed. Rep. of Germany, assignor to Surculus AG, Vaduz, Liechtenstein

Continuation-in-part of Ser. No. 561,198, Dec. 14, 1983, abandoned. This application Dec. 12, 1985, Ser. No. 809,059

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1983, 3302842; European Pat. Off., Nov. 12, 1983, 83111317.0

Int. Cl.[4] B65D *41/26, 41/50, 41/58;* A47G *19/22*

U.S. Cl. 229—1.5 B 57 Claims



1. A multiple-purpose vessel for application to the open end portion of a container whose open end portion has a partially spherical external surface, comprising a drinking cup; and at least one closure for the open end portion of the container, said cup having a bottom, and said closure being provided on said cup in the region of said bottom and including a cap which is arranged to overlie and surround the open end portion of the container and has a concave, partially spherical internal surface substantially complementary to the external surface of the container, said cap consisting at least in part of an elastically deformable material and being designed for application to the open end portion of the container by snap action so that said surfaces are in sealing contact with one another to prevent spillage of the contents of the container, and said cap having a section which is disposed on the side of said internal surface remote from said bottom and diverges outwardly in a direction away from said bottom so as flare away from the container when said cap overlies and surround the open end portion thereof, said section and the complementary partially spherical surfaces of the container and said cap providing freedom for said closure to swivel within limits with reference to the open end portion of the container while sealing contact between said surfaces is maintained.

4,693,411

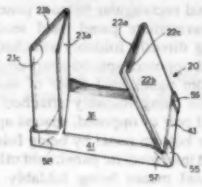
COLLAPSIBLE BULK SHIPPING CONTAINER

Teddy R. Snyder, Maumee, Ohio, assignor to OI Forest Products STS Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 859,957, May 5, 1986, Pat. No. 4,691,859. This application Jun. 13, 1986, Ser. No. 873,929

Int. Cl.[4] B65D *5/35*

U.S. Cl. 229—23 R 32 Claims



1. A collapsible bulk shipping container comprising:

a tray-type bottom, said tray-type bottom having:

a rectangular bottom panel, said rectangular bottom panel having a first pair of opposed, 5. spaced-apart edges and a second pair of opposed, spaced-apart edges, said second pair of opposed, spaced-apart edges extending transversely between said first pair of opposed, spaced-apart edges;

a first pair of panel means, one of said 10. first pair of panel means being foldably attached to one of said first pair of opposed, spaced-apart edges of said rectangular bottom panel, at least a portion of said one of said first pair of panel means being foldable with respect to said rectangular bottom panel from a first position in which said at least a portion of said one of said first pair of panel means extends generally parallel to said rectangular bottom panel to a second position in which said at least a portion of said one of said first pair of panel means extends 20. generally normally from said rectangular bottom panel, at least a portion of the other of said first pair of panel means being foldably attached to the other of said first pair of opposed, spaced-apart edges of said rectangular bottom panel, said at least a portion of said other of said first pair of panel means being foldable with respect to said rectangular bottom panel from a first position in which said at least a portion of said other of said first pair of panel means extends generally parallel to said rectangular bottom panel to a second position in which said other of said at least a portion of said first pair of panel means extends generally normally from said rectangular bottom panel;

a second pair of panel means, one of said second pair of panel means being foldably attached to one of said second pair of opposed, spaced-apart edges of said rectangular bottom panel, said one of said second pair of panel means being foldable, with respect to said rectangular bottom panel, from a first position in which said one of said second pair of panel means extends generally parallel to said rectangular bottom panel to a second position in which said one of said second pair of panel means extends generally normally from said rectangular bottom panel, the other of said second pair of panel means being foldably attached to the other of said second pair of opposed, spaced-apart edges of said rectangular bottom panel;

a first intermediate panel, said first intermediate panel being directly foldably attached to one of said second opposed, spaced-apart edges of said rectangular bottom panel, one of said second pair of panel means being foldably attached to said one of said second pair of

opposed, spaced-apart edges of said rectangular bottom panel by being foldably attached to said first intermediate panel, said one of said second pair of panel means being foldably attached to said first intermediate panel along a first intermediate fold line which is spaced from and which extends generally parallel to said one of said second pair of opposed, spaced-apart edges of said rectangular bottom panel, said first intermediate fold line and said one of said second pair of opposed, spaced-apart edges of said rectangular bottom panel forming a first space therebetween, said first space having a width extending between said first intermediate fold line and said one of said second pair of opposed, spaced-apart edges of said rectangular bottom panel; and

a second intermediate panel, said second intermediate panel being directly foldably attached to the other of said second opposed, spaced-apart edges of said rectangular bottom panel, said other of said second pair of panel means being foldably attached to said other of said second pair of opposed, spaced-apart edges of said rectangular bottom panel by being foldably attached to said second intermediate panel, said other of said second pair of panel means being foldably attached to said second intermediate panel along a second intermediate fold line which is spaced from and which extends generally parallel to said other of said second pair of opposed, spaced-apart edges of said rectangular bottom panel, said second intermediate fold line and said other of said second pair of opposed, spaced-apart edges of said rectangular bottom panel forming a second space therebetween, said second space having a width extending between said second intermediate fold line and said other of said second pair of opposed, spaced-apart edges of said rectangular bottom panel; and

a pair of body segments, each of said pair of body segments being telescoped within said tray-type bottom and further being collapsible from a first, open configuration in which said pair of body segments form, with one another, a tubular structure having a rectangular configuration to a second, collapsed configuration, each of said pair of body segments having:

a first side having first and second spaced-apart edges, said first side being disposed adjacent to, and being substantially coextensive with, one of said second pair of panel means of said tray-type bottom, said first side of one of said pair of body segments being secured to said one of said second pair of panel means of said tray-type bottom, said first side of the other of said pair of body segments being secured to the other of said second pair of panel means of said tray-type bottom; and

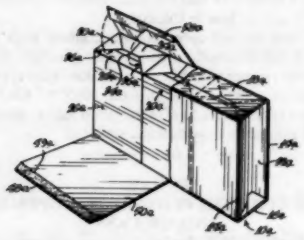
second and third sides, the second side of each of said pair of body segments being foldably attached to one of said first and second spaced-apart edges of said first side of said each of said pair of body segments, the third side of each of said pair of body segments being foldably attached to the other of said first and second spaced-apart edges of said first side of said each of said pair of body segments, each of the second and third sides of each of said pair of body segments being foldable with respect to said first side of said each of said pair of body segments between a first position in which said each of said second and third sides extends generally perpendicularly to said first side of said each of said pair of body segments and a second position in which said each of said second and third sides extends generally parallel to said first side of said each of said pair of body segments, each of said pair of body segments being foldable with respect to said rectangular bottom panel of said tray-type bottom between a first position in which said each of said pair of body segments extends generally perpendicularly to said rectangular bottom panel and a second position in which said each pair of body segments extends generally parallel to said rectangular bottom panel, said second and third sides of said each of said pair of body segments being in said second position with respect to said first side of said each of said pair of body segments when said each of said pair of body segments is in said second position with respect to said tray-type bottom.

4,693,412

SLEEVE PACKAGE HAVING LOCKING TABS FOR HOLDING MULTIPLE ACEPTIC CARTONS

William E. Yeaman, Sr., Park Ridge, Ill., assignor to Yeaman Packaging Group, Inc., Wheeling, Ill.

Filed Sep. 9, 1985, Ser. No. 773,793
Int. Cl.[4] B65D *75/06*
U.S. Cl. 229—40 **16 Claims**



1. A sleeve package for holding a plurality of aceptic cartons in a row, the combination of

each carton being of a block shape having opposed pairs of side walls and a pair of end walls, and the walls of each of such pairs being transverse to one another,

one end wall of each carton comprising an end closure having a main panel and an overlapping flap, said flap having a portion disposed transverse to the main panel,

a paperboard blank formed with adjacent panels, hinged to one another across spaced respective fold lines, the panels including at least one major panel and inner and outer lap panels,

said blank being adapted to be wrapped around the cartons, with the lap panels secured together and overflapping the one end wall of each carton, to define a sleeve having a pair of open ends,

said cartons being in the sleeve with the row aligned with the open ends of the sleeve,

the cartons at the opposite ends of the row being exposed out the open ends of the sleeve,

the end closure flap portion being disposed transverse to the open ends of the sleeve and facing the adjacent open end of the sleeve,

a tab formed off of the inner lap panel adjacent one of the exposed end cartons,

the tab having an edge extended transverse to the fold lines in the blank, and being shaped and located to have said edge cooperate with the carton end closure flap portion, to hold the one carton within the sleeve.

4,693,413

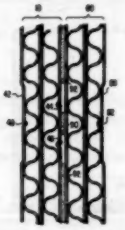
LAMINATED BULK BIN CORNER STRUCTURE

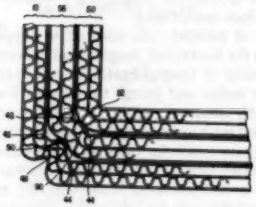
William W. McFarland, Maryville; Russell E. Gandy, Georgetown, both of S.C., and Michael A. Churvis, Murfreesboro, Tenn., assignors to International Paper Company, Purchase, N.Y.

Filed Nov. 20, 1986, Ser. No. 932,821
Int. Cl.[4] B65D *5/42*
U.S. Cl. 229—48 R **4 Claims**

1. A paperboard laminate for forming a bulk bin by folding the laminate, the laminate being planar and adapted to be

folded 180 degrees and then to be refolded back 90 degrees to a 90 degree position from its original, planar form, the laminate including a first, bulk bin exterior forming corrugated paperboard layer and a next adjacent corrugated paperboard layer, a common interface surface between said first and second corrugated paperboard layers, said first layer having on its said interface surface a pair of parallel score lines, a score line located substantially midway between said first mentioned pair of score lines and located on the non common interface surface of said first layer, said score lines all being parallel to each other, said second layer being overlapped and adhered to said





first layer, the common interface surface of said second layer being adhered, along an attachment strip thereof, to a corresponding attachment strip on the common interface surface of the first layer, said strip being substantially midway between said first mentioned pair of parallel score lines, whereby a 180 degree fold is formed by folding 90 degrees along each of said parellel lines on the common interface surface of said first layer and whereby upon refolding the 180 degree fold back 90 degrees, the several components of the corrugated paperboard layers do not become distorted and therefore retain their strength and uniform appearance at the refolded, 90 degree position.

4,693,414

CONTAINER CLOSURE DEVICE

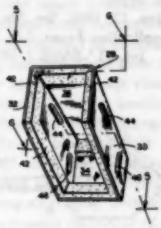
Louis Allen, 166 E. 61 St., New York, N.Y. 10021

Filed Sep. 8, 1986, Ser. No. 904,968

Int. Cl.[4] B65D *5/64*

U.S. Cl. 229—125.02 **21 Claims**

1. A container closure device for a package container having a dispensing aperture comprising a shell including a pair of face plates, a side panel, and a top panel, means for urging at least the face plates toward each other, a compressible lining within the shell conforming to the container for providing a tight seal,



and locking means interacting with the container walls for providing snap-fitting engagement with the container.

4,693,415

METHOD AND CIRCUITRY FOR CONTROL OF A SANITARY MIXER FOR COLD AND HOT WATER

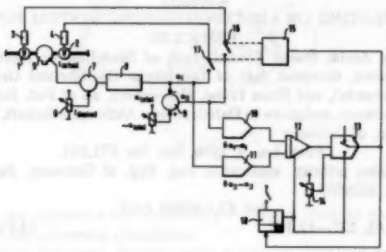
Hans-Josef Sturm, Friedrichsdorf, Fed. Rep. of Germany, assignor to Knebel & Rottger GmbH & Co., Iserlohn, Fed. Rep. of Germany

Filed May 16, 1986, Ser. No. 864,158

Claims priority, application Fed. Rep. of Germany, May 23, 1985, 3518645

Int. Cl.[4] G05D *23/185*

U.S. Cl. 236—12.12 **16 Claims**



1. Method for control of a sanitary mixer for cold and hot water by carrying out temperature control by means of a comparison between the actual temperature of the mixed water and a preset temperature, comprising:

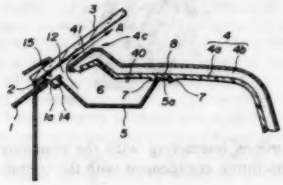
continuously measuring the actual temperature in the mixed water and electronically deriving at least two separate, time-varying regulating values, used for electromechanical adjustment both of the cold water supply as well as of the hot water supply, from the difference between the set temperature and the actual temperature and taking into account preset flow rate of the mixed water to be kept constant during temperature control in the determination of the regulating valves; and

determining from the time-varying regulating values partial flow rates proportional to the regulating values, continuously determining from the partial flow rates the instantaneous cumulative filling volume of the mixed water, and, when a cumulative filling volume value equal to a preset cumulative filling volume is reached, setting the regulatingvalues to zero, thus shutting off the cold water supply and the hot water supply.

4,693,416
DEFROSTER STRUCTURE FOR VEHICLE

Toshihiro Hayakawa, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jun. 12, 1986, Ser. No. 873,523
Claims priority, application Japan, Jun. 14, 1985, 60-90756[U]
Int. Cl.[4] B60H 1/00
U.S. Cl. 98—2.09 5 Claims



1. A defroster structure for a vehicle having a defroster member disposed in the vicinity of a cowl and a nozzle opening of the defroster formed in the vicinity of a window shield of an instrument panel comprising:

an enclosed space surrounded by an inner wall of the instrument panel and a tray-shaped defroster member under the inner wall in the vicinity of the window shield; and

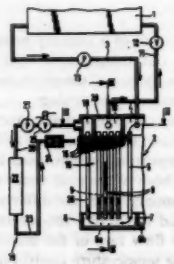
a plurality of fins integrally formed with the defroster member for forming the nozzle opening, said nozzle opening formed at the foremost position of the instrument panel in the vicinity of the window shield in the longitudinal direction of a vehicle;

wherein said nozzle opening provides the sole communication between said enclosed space and said window shield.

4,693,417
HEATING OR AIR-CONDITIONING SYSTEM FOR VEHICLES

Klaus Arold; Heinz Koukal, both of Sindelfingen; Hermann Grimm, deceased, late of Ostelsheim (by Christel Grimm, executrix), and Hans Trube, Herrenberg, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 9, 1986, Ser. No. 871,893
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520553
Int. Cl.[4] B60H 1/02
U.S. Cl. 237—12.3 B 14 Claims



1. A vehicle heating or air-conditioning system comprising:

main heat exchanger means having forward flow tank means and return flow tank means connected to return cooled water to an engine, said tank means being connected to one another by a plurality of parallel flowing ribbed connecting tubes against which air flows that is guided into a vehicle passenger space, and

auxiliary heat exchanger means having auxiliary panel radiator means arranged in the vehicle interior, said panel radiator means being supplied by fluid heat medium from an auxiliary heat supply portion of the return flow tank means of the main heat exchanger means.

4,693,418
MODULAR FLOOR

Robert J. Peterman, Hartland, Wis., assignor to Spacesaver Corporation, Fort Atkinson, Wis.

Filed Aug. 16, 1985, Ser. No. 766,249
Int. Cl.[4] E01B 23/00
U.S. Cl. 238—10 R 13 Claims

1. A floor module for supporting a wheeled carriage above a building floor comprising:

a. a pair of parallel rails adapted to support the carriage wheels for horizontal longitudinal movement therealong;

b. a plurality of longitudinally spaced beams placed transversely under and joined to the rails for supporting the rails, the opposed ends of the transverse beams being provided with upturned tab means outboard of the respective adjacent rails for defining longitudinal channels;

c. at least two vertically adjustable leveling screws received within each transverse beam near the ends thereof and outboard the rails for vertically adjusting the rails;

d. panel means and means for securing said panel means to the transverse beams to form a unitary module; and

e. a ramp extending transversely from each side of the module, each ramp having a first end for being supported on the building floor and a second end defining hook means for being removably received within the transverse beam longitudinal channels defined by the beam upturned tab means, the ramps being of sufficient size and strength for a person to walk on them adjacent the wheeled carriage.

4,693,419
AUTOMATIC CONTROL APPARATUS AND METHOD FOR SPRINKLING WATER OVER A PREDETERMINED AREA

Marvin H. Weintraub, West Bloomfield; Donald R. Bernier, Lake Orion, and Larry Cameron, Sterling Heights, all of Mich., assignors to Water Sentry, Inc., Southfield, Mich.

Filed Nov. 2, 1981, Ser. No. 317,334
Int. Cl.[4] A01G 25/16
U.S. Cl. 239—63 1 Claim

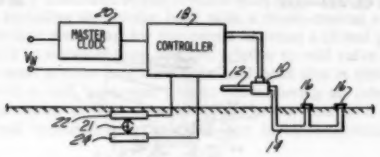
1. A control apparatus for controlling the release of water over a predetermined area comprising:

first and second sensor means for sensing an electrical resistance indicative of the degree of moisutre content of the soil within the predetermined area;

means for mounting the first and second sensor means in a horizontal or entation within the soil, with the first sensor means disposed immediately below the plant root layer and the second sensor means spaced below the first sensor means a predetermined distance related to the wilt point of moisture content of the particular type of soil within the predetermined area , the mounting means including a strip-like member having a plurality of spaced apertures formed therein, the first and second sensor means being

removably insertable into selected ones of the apertures at a predetermined horizontal spacing

means for establishing an electrical reference value equivalent to the wilt-point amount of moisture content of the particular type of soil found in the predetermined area;



means for comparing the reference value and the output of the first and second sensor means; and

output means, responsive to the comparator means, for controlling the release of water to the predetermined area.

4,693,420

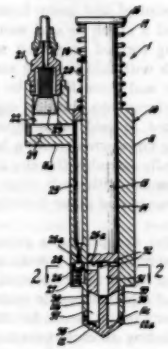
AIR-ASSIST FUEL INJECTION NOZZLE

Edward D. Klomp, Mount Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 25, 1986, Ser. No. 900,093

Int. Cl.[4] F02M *47/00*

U.S. Cl. 239—87 **3 Claims**



1. An air-assist fuel injection nozzle for use in discharging fuel into an associate combustion chamber of an internal combustion engine, said injection nozzle including a nozzle body means having a spray tip end at one end thereof that includes an outer straight walled, spray tip portion which terminates at an enclosed end having an internal wall of frusto-conical configuration with a central pin upstanding therefrom, said straight walled spray tip portion having a plurality of radial discharge orifices extending therethrough; an axial bore in said body means extending from the opposite end thereof to define a bushing, a needle plunger reciprocably received in said bushing between a fully raised position and a fully depressed position corresponding to the end of a suction stroke and the end of a pump stroke, respectively, one end of said needle plunger extending outward from said opposite end of said nozzle body means so as to be externally actuatable, the opposite end of said needle plunger having a blind bore extending a predetermined axial extent and of an internal diameter to slidably receive said central pin, said needle plunger having a radial supply passage and a plurality of circumferentially spaced apart radial discharge ports angularly aligned with said radial discharge orifices, wherein said discharge ports are in flow communication with said blind bore, said needle plunger and the interior portion of said enclosed end of said nozzle body means defining a variable volume pump chamber, said nozzle body means including a supply passage means with a check valve therein in fluid communication with said radial supply passage when said needle plunger is in said raised position, the opposite end of said supply passage means being connectable so as to sequentially receive a metered quantity of pressurized fuel, said needle plunger allowing aeriform fluid flow from said associate combustion chamber into said pump chamber through said radial discharge orifices when said needle plunger is in said raised position and when said needle plunger is on a said pump stroke, said needle plunger blocking flow through said radial discharge orifices until such time as said needle plunger has moved a predetermined axial extent so that said radial discharge ports come into alignment with said radial discharge orifices to initiate an air-assist discharge of air, fuel vapors and fuel from said radial discharge orifices.

4,693,421

APPARATUS FOR CONDUCTING HOT GASES FROM AN EXHAUST PIPE

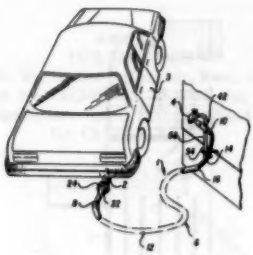
Allan Cameron, Sr., 4602 Morris Avenue, Terrace, British Columbia, Canada V8G 2H1

Filed Apr. 14, 1986, Ser. No. 851,349

Claims priority, application Canada, Apr. 15, 1985, 479107

Int. Cl.[4] B05B *1/24, 15/06, 15/08*; F16L *25/00*

U.S. Cl. 239—129 **3 Claims**



1. An apparatus for conducting hot gases from an exhaust pipe, the apparatus comprising:

(a) an elongated, flexible conduit with an inlet end and an outlet end, the conduit having a portion comprising a spirally wound conduit which is flexible when twisted in one direction and locks in a desired position when twisted in a direction opposite the one direction, the portion being adjacent the outlet end;

(b) an outlet fitting on the outlet end of the conduit, shaped to direct the hot gases to an object to be heated;

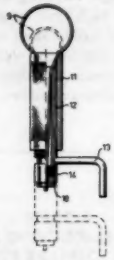
(c) an inlet fitting on the inlet end of the conduit having a flexible seal for frictionally engaging exhaust pipes of different sizes, the seal comprising a resilient annular member having a central aperture therein for receiving the exhaust pipe, the inlet fitting having a truncated conical shape which has a larger end for facing towards the exhaust pipe, the member being adjacent the larger end and having radial slits extending outwardly from the central aperture whereby the gases can escape between the slits if the conduit or the outlet fitting is blocked; and

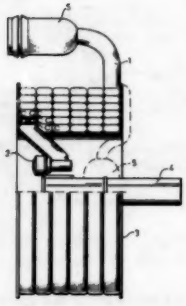
(d) clamp means on the conduit for holding the outlet fitting in position, the clamp means being near an end of the portion of the conduit opposite the outlet fitting, the clamp means including a pair of pivotally connected members which are resiliently biased towards each other.

4,693,422
DEVICE FOR FIRE FIGHTING

Karl-Gustav Persson, Gislaved, Sweden, assignor to IKO Kabel AB, Grimsas, Sweden

Continuation of Ser. No. 692,962, Jan. 18, 1985, abandoned. This application Sep. 29, 1986, Ser. No. 912,665
Claims priority, application Sweden, Jan. 20, 1984, 8400270
Int. Cl.[4] A62C *33/04;* F16L *33/02*
U.S. Cl. 239—195 9 Claims





5. A device for fire fighting comprising:

a flexible tube having two opposed ends for transmitting fluid;

a nozzle at one of said ends;

a coupling joined to the other of said ends for fitting the tube onto a fluid source connection;

a flexible securing member wound around said coupling for holding said coupling on the fluid source connection, said securing member have two end portions;

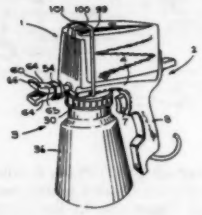
operating means joined to said end portions of said securing member for tightening said securing member around said coupling, said operating means including an outer portion and an inner portion extending axially beyond one end of the outer portion when said operating means is in a resting position; and

gliding means positioned between the operating means and said end portions for exerting a predetermined amount of pressure therebetween in order to oppose turning movement of said end portions during the tightening operation and to cause said inner portion to recede into the one end of said outer portion when the predetermined amount of pressure is exceeded to indicate that a sufficient tractive force has been applied to said coupling.

4,693,423
POWER PAINT SPRAYER

Elverton O. Roe, and C. Gregg Moore, both of Wooster, Ohio, assignors to The Wooster Brush Company, Wooster, Ohio

Filed Feb. 25, 1986, Ser. No. 832,598
Int. Cl.[4] B05B *9/043;* F16B *37/08*
U.S. Cl. 239—332 25 Claims



1. Sprayer apparatus comprising a pump and container assembly including a pump housing containing a liquid pump and a container for the liquid to be sprayed suspended from said pump housing, a separate power handle assembly including a motor housing containing motor means for driving said pump, said pump housing and said power handle assembly having oppositely facing locating surfaces, and mounting means for detachably mounting said pump housing to said motor housing, said mounting means including a bottom recess in said motor housing for receipt of said pump housing, a flange on said pump housing and a notch in said motor housing, said flange and notch being formed to permit said flange to be inserted into said notch with said locating surfaces initially at an angle to each other and thereafter to be pivoted so as to bring said locating surfaces into abutting engagement, and a bail pivotally connected to said pump housing for pivotal movement into locking engagement with a bail retention surface on said power handle assembly thereby to hold said locating surfaces in engagement with each other to limit relative vertical movement between said pump housing and said power handle assembly.

19. Sprayer apparatus comprising a pump and container assembly including a pump housing containing a liquid pump and a container for the liquid to be sprayed suspended from said pump housing, and a power handle assembly including a motor housing containing motor means for driving said pump, said motor means including an electromagnet and associated armature that reciprocates when an alternating current is applied to said electromagnet, and said pump including an axially movable pump piston, and spring means for biasing said pump piston into engagement with one side of said armature, and said power handle assembly including a stroke limiting screw movable toward and away from the opposite side of said armature for limiting the movement of said armature in a direction away from said pump piston, and split nut means biased into frictional engagement with opposite sides of said stroke limiting screw for applying a friction load to said stroke limiting screw preventing creep of said stroke limiting screw due to vibrations and the like.

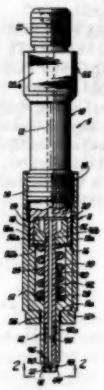
4,693,424
POPPET COVERED ORIFICE FUEL INJECTION NOZZLE

David P. Sczomak, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 754,769, Jul. 15, 1985, abandoned. This application Jul. 23, 1986, Ser. No. 889,259
Int. Cl.[4] B05B *1/32;* F02M *61/10*
U.S. Cl. 239—453 3 Claims

1. A poppet covered orifice fuel injector nozzle for use in a direct injection type diesel engine, said fuel injector nozzle including an injector body means having an inlet for pressur-

ized fuel at one end thereof and having a spray tip at the opposite end thereof; said spray tip having a discharge free end and having an axial stepped through bore of predetermined internal diameter therein at its discharge free end with an annular frusto-conical valve seat encircling said bore at said discharge free end of said spray tip, an outward opening poppet valve operatively positioned in said injector body means, said poppet valve including an annular head with a frusto-conical valve seat surface positioned for movement between a closed position and an outward open position relative to said valve seat and a stem portion extending from said head that is slidably received in said bore; said poppet valve having an internal passage means in fluid communication at one end with said inlet and terminating at its other end in circumferentially



spaced apart radial orifices that are inclined and located so as to discharge fuel parallel to and directly across said valve seat surface of said head; each of said orifices having a Length of orifice to Diameter of orifice ratio on the order of 4 to 8; and spring means operatively associated with said poppet valve to normally bias said head of said poppet valve to said closed position; said frusto-conical valve seat and said valve seat surface together with said discharge free end of said spray tip being configured so that said valve seat surface will effect sealing engagement with said valve seat at substantially the outer peripheral edge thereof with substantially no overhang of these elements with respect to each other whereby to prevent fuel wetting during injection when said head is moved to said open position and to prevent fuel flow from said orifices when said head is in said closed position.

4,693,425

DRIVE FOR MOVABLE IRRIGATION SYSTEM AND THE LIKE

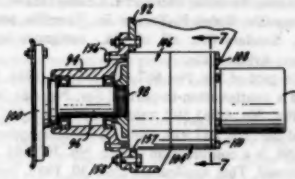
Charles H. Meis, Albion, and Duane B. Overvaag, Columbus, both of Nebr., assignors to Lindsay Manufacturing Co., Lindsay, Nebr.

Division of Ser. No. 626,546, Jun. 29, 1984, Pat. No. 4,618,102, which is a continuation-in-part of Ser. No. 588,376, Mar. 12, 1984, abandoned. This application May 19, 1986, Ser. No. 864,331

Int. Cl.[4] **A01G** *25/09;* **B05B** *3/18*

U.S. Cl. 239—735 **6 Claims**

2. In a movable irrigation system, an elongated water distribution pipe, a plurality of movable towers supporting the pipe at spaced intervals, ground engaging wheels on each tower, at least one high speed electric motor on each tower, a drive train between the electric motor and at least one of the wheels, and a gear reduction mechanism in the drive train for reducing the speed of rotation and increasing the torque, including input and output shafts therefor, the input shaft being driven by the electric motor and the output shaft driving at least one of the ground engaging wheels, two gear assemblies, the first being constructed and arranged for maximum speed reduction and minimum torque capacity and driven by the input shaft, and



the second being driven by the first and constructed and arranged for minimum speed reduction and maximum torque capacity and driving the output shaft.

4,693,426

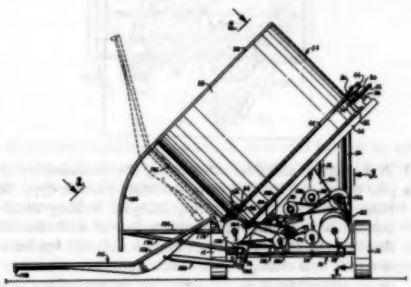
TUB CHOPPER

Allen A. White, Rte. 2, Box 9, Peabody, Kans. 66866

Division of Ser. No. 229,347, Jan. 29, 1981, Pat. No. 4,364,526. This application Sep. 7, 1982, Ser. No. 415,655

Int. Cl.[4] **B02L** *13/286*

U.S. Cl. 241—18 **6 Claims**



1. A method of comminuting material comprising the steps of:

confining the material between a pair of members disposed to define a V-shaped cavity therebetween, the respective angles of inclination of each member being greater than the angle of repose of the material thereon to insure gravitation of the material toward the bottom of the cavity;

maintaining one of said members stationary;

moving the other member across the path of gravitation of material on the stationary member to engage said material with the moving member; and

chopping the material at a station proximal the bottom of the cavity, whereby the moving member and gravitation of the material cooperate to produce uniform feeding of the material to the chopping station.

4,693,427

METHOD FOR IMPROVING HANDLEABILITY OF CALCINED KAOLIN CLAY PRODUCTS

Bomi M. Bilimoria, Tennille; Herbert I. Lewis, Wrens; Jerry A. Cook, Cartersville; Ralph E. Turner Jr., Tennille, and Robert H. Garner, Sandersville, all of Ga., assignors to E.C.C. America Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 667,400, Nov. 2, 1984, Pat. No. 4,593,860, and a continuation-in-part of Ser. No. 661,266, Oct. 15, 1984, Pat. No. 4,561,597, said Ser. No. 667,400, is a continuation of Ser. No. 341,918, Jan. 21, 1982, abandoned, said Ser. No. 661,266, is a continuation of Ser. No. 390,855, Jun. 22, 1982, abandoned. This application Dec. 30, 1985, Ser. No. 814,644

The portion of the term of this patent subsequent to Dec. 31, 2002, has been disclaimed.

Int. Cl.[4] B02C *21/00*

U.S. Cl. 241—23 9 Claims

1. A method of preparing a calcined kaolin clay powder having increased bulk density and decreased wet-out time comprising:

(a) heating a kaolin clay powder of fine particle size to at least 400° C. to render same at least substantially anhydrous; and

(b) dry milling said anhydrous clay powder in a media mill using media having a particle size of at least +5 mesh, and using a work input in the range of from about 5 to about 40 HP-hrs/ton of dry clay.

4,693,428

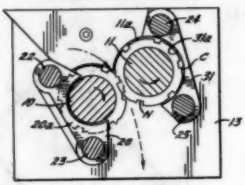
PARTICLE-TYPE SHREDDING MECHANISM

Donald E. Raterman, Deerfield, and James M. Amburn, Mundelein, both of Ill., assignors to Cummins Allison Corporation, Mt. Prospect, Ill.

Filed Nov. 1, 1984, Ser. No. 667,151

Int. Cl.[4] B02L *18/16*

U.S. Cl. 241—167 5 Claims



1. A document shredder comprising the combination of

a pair of spaced apart counter-rotating particle-type document shredder rolls forming integral cutting discs the cutting discs on one roll being interleaved with the cutting discs on the other roll for cutting documents fed between the rolls into multiple strips each disc on a respective roll being spaced from an adjacent disc on the same roll, said discs also having cutting edges extending longitudinally of the rolls for cutting said multiple strips into short segments,

multiple spacers mounted along the length of each roll, a spacer extending into each space between a pair of adjacent cutting discs on the same roll and extending around only a portion of the circumference of the roll on the side thereof which is substantially opposite to the space between the rolls, and

multiple diverters spaced along the length of each roll a diverter being in register with each of a respective cutting disc on the respective rolls, each of said diverters having an arcuate surface having end portions located radially outwardly of the respective cutting disc and closely adjacent to the peripheral outer surfaces respective of said disc on the side thereof which is substantially opposite to the space between the rolls for preventing the accumulation of said short segments of the cut documents adjacent said rolls.

4,693,429

DEVICE AND PROCESS FOR SIMULTANEOUSLY WINDING SEVERAL SEPARATE FIBERS ON A ROTATING SUPPORT

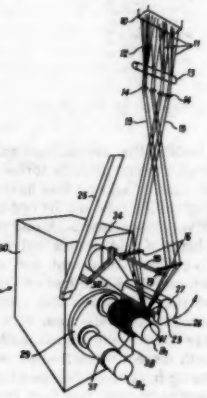
Georges Billard, Chamberly-Le-Vieux; Francoise Blanchard, Chambery; Willy Klemenz, Cognin; Roger Combet, La Motte Servolex, and Daniel Richard, Montmelian, all of France, assignors to Vetrotex Saint Gobain, Chambery, France

Filed Nov. 14, 1985, Ser. No. 798,071

Claims priority, application France, Jul. 25, 1985, 85 11378

Int. Cl.[4] B65H *54/08, 54/28*

U.S. Cl. 242—18 G 11 Claims



1. Apparatus for forming and winding on the same support several continuous fibers of thermoplastic material comprising:

a spinneret receiving said thermoplastic material and keeping said thermoplastic material in a molten state;

a rotating spindle carrying said support and mechanically drawing strands of said material from orifices of said spinneret in the form of elementary filaments;

a gathering and guide device to group said filaments into at least two separate fibers and to guide said fibers to said spindle;

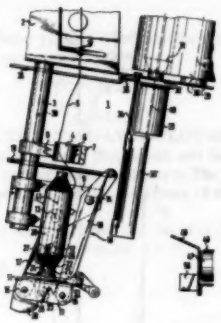
a crisscrossing device near the spindle including a fiber guide driven back and forth by said crisscrossing device along a line of travel in front of said spindle, said fiber guide positively guiding said fibers and moving them back-and-forth to distribute said fibers on said support, said fiber guide having an opening in front of said spindle communicating with an interior guide zone of said fiber guide, at least two notches in said fiber guide communicating with and opening into said interior zone; and

a stop positioned near each end of travel of said fiber guide for engaging at least the outside one of said fibers when said fiber guide reaches its end of travel.

4,693,430
WINDING STATION OF AN AUTOMATIC WINDING MACHINE

Dietmar Engelhardt, and Hans Grecksch, both of Monchen-Gladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Sep. 26, 1986, Ser. No. 912,765
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1985, 3534267
Int. Cl.[4] B65H *49/04, 67/02*
U.S. Cl. 242—18 R **11 Claims**

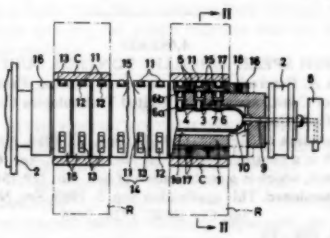


1. Winding station of an automatic winding machine, comprising a holder, a movable mounting mandrel supported by said holder for receiving a tube of a feeding bobbin, a bobbin delivery slide for feeding a bobbin to said mounting mandrel, an unwinding accelerator for accelerating unwinding of a thread from the bobbin, and a captively controllable displacement apparatus associated with said holder for at least approximately parallel displacement of said mounting mandrel between a tube mounting position below said bobbin delivery slide and an unwinding position below said unwinding accelerator.

4,693,431
WINDING SHAFT FOR SHEET REWINDER

Hiroshi Kataoka, 3686, Sangawacho, Iyomishima-shi, Ehime 799-04, Japan

Filed Dec. 31, 1985, Ser. No. 815,013
Int. Cl.[4] B65H *75/24, 23/195;* B23B *5/22*
U.S. Cl. 242—72 B **6 Claims**



1. A sheet winding shaft comprising:

a hollow shaft having a plurality of through-holes formed in the peripheral wall thereof so as to be disposed radially at predetermined intervals, the wall surfaces of said hollow shaft defining each of said plurality of through-holes each of said plurality of through-holes having an inner projection provided at the inner end of each said through-hole;

a plurality of retainer rings each provided in the outer open end of each said through-hole;

a plurality of drum rings rotatably fitted about said hollow shaft to close the outer open end of each said through-hole and each having an inner periphery serving as a frictional suface;

core-locking means each provided on the outer periphery of each said drum ring to come into contact with the inner periphery of a core;

a plurality of pairs of support rings, each pair of which has outer peripheries fixed to the opposite ends of the inner periphery of each said drum ring rings and each pair having the inner peripheries thereof kept in contact with the outer periphery of said hollow shaft, thereby supporting each of said drum rings on said hollow shaft;

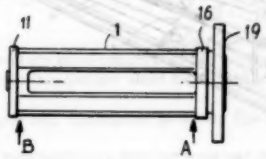
a plurality of plungers each provided with a flange and each movably inserted into each said through-hole, each said plunger having a length large enough to project both outwardly from each of said retainer rings and inwardly from each said inner projections, each of said flanges having a diameter larger than the inner diameter of each said retainer ring and also larger than the inner diameter of the inner projections; and

an expansible air tube provided in said hollow shaft and, when being expanded, adapted to outwardly urge said plungers within said through-holes.

4,693,432
WINDING MANDREL ESPECIALLY FOR A SAFETY STRAP

Alain P. Tourret, Audincourt, France, assignor to Aciers et Outillage Peugeot, Audincourt, France

Filed Jun. 26, 1986, Ser. No. 878,764
Claims priority, application France, Jun. 26, 1985, 85 09741
Int. Cl.[4] F16B *21/00*
U.S. Cl. 242—74 **3 Claims**



1. A winding mandrel for a safety strap and having an axis, comprising: a plastic winding body molded on a metal insert (1; 8), the body and the insert having slot means (2; 22*a*) for receiving one end of the strap, wherein the insert is composed of two elements (3, 4) each comprising a central portion (3*a*) and flared wings (3*b*, 3*c*), said elements being fastened to one another at their central portions, so that the wings are arranged symmetrically in relation to the axis of the mandrel.

4,693,433
UNWIND STAND FOR WEB ROLLS

Merrill D. Martin, 5405 Bacon Rd., Oakland, Calif. 94619

Filed Jun. 6, 1986, Ser. No. 871,275
Int. Cl.[4] B65H *19/30;* B61H *13/12*
U.S. Cl. 242—58.6 **7 Claims**

1. An unwind roll stand for handling paper rolls on a spool for supplying a web of paper to a processing machine comprising:

a travelling carriage;

a control cab forming a part of said carriage;

a pair of parallel swing lift arms positioned on movable bases;

said arms being pivoted on and keyed to a rotating shaft to insure their alignment with each other;

one end of said shaft being journaled on said carriage and the other end on an outboard support;

hydraulic means for raising and lowering said lift arms comprising:

hydraulic cylinders pivotally mounted on said arms;

piston rods one end engaging pistons within said cylinders and the opposite end pivotally mounted on said bases to exert a thrust thereon;

hydraulic means to operate said pistons to produce a reciprocating motion;

a pair of parallel steel rails positioned longitudinally beneath said roll stand;

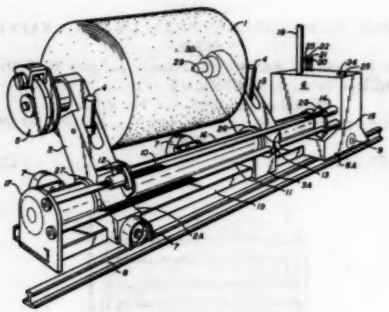
said bases being mounted on wheels engaging said rails;

said carriage being mounted on an axle carrying flanged wheels engaging said rails;

means for moving said bases and said arms simultaneously in a longitudinal direction along said rails independently of said carriage;

means for moving each of said bases and said arms separately in a longitudinal direction along said rails independently of said carriage to accommodate said rolls therebetween;

said means for moving said bases and said arms in a longitudinal direction comprising:



a pair of rotating screws;

hydraulic motors coupled to one end of each of said screws;

said motors being mounted on collars positioned on said carriage;

the opposite end of said screws being journaled into said outboard support;

travelling nuts disposed for engaging said screws;

said nuts being fixedly positioned on said bases;

hydraulic means for turning each of said motors separately;

hydraulic means for turning both of said motors simultaneously;

spindles positioned at the outer ends of the facing sides of said arms and having adjustable brakes mounted thereon;

pointed chuck means positioned on said spindles and disposed to engage axially the ends of said spool in said rolls at their centers and thereby grip them in position;

means for driving said axle and flanged wheels on said carriage and moving it longitudinally along said rails;

means for controlling the movement of said bases, said arms and said carriages positioned in said control cab.

4,693,434

SELF-DEPLOYING STABILIZING-VANE ASSEMBLY FOR PROJECTILE

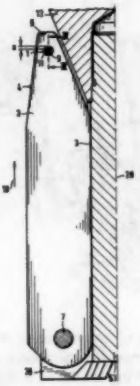
Michael Schwenzer, Duesseldorf; Armin Eskam, Langenfeld; Walter Simon, Herzogenrath, and Wilfried Becker, Duesseldorf, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Sep. 23, 1985, Ser. No. 779,228

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434879

Int. Cl.[4] F42B *13/32*

U.S. Cl. 244—328 **10 Claims**



1. A vane assembly for a projectile which is to be fired from a gun barrel, the assembly comprising:

a carrier carrying a plurality of pivots, having at the pivots respective vane elements which are adapted to be secured to an end of the projectile;

each of said respective vane is pivotal on the pivots between an inner position lying immediately adjacent to said carrier and an outer deployed position projecting beyond the carrier; and

means including respective heat-destructible tubular pins engaged between the vane elements and the carrier for normally retaining the vanes in the inner position and for releasing the vanes for movement into the outer position when destroyed by heat, said tubular pins being made of a combustible material which completely burns up about the time the projectile exits from the muzzle of the gun barrel.

4,693,435

HIGH SPEED AIRCRAFT CONTROL SURFACE

William A. Percival, Granby, and Leon Stoltze, Eart Harland, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

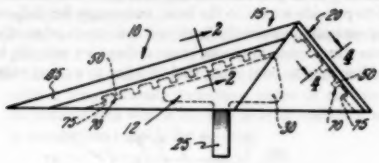
Continuation of Ser. No. 648,617, Sep. 10, 1984, abandoned, which is a continuation of Ser. No. 482,386, Apr. 6, 1983, abandoned, which is a continuation of Ser. No. 219,754, Dec. 23, 1980, abandoned. This application Sep. 5, 1985, Ser. No. 773,100

Int. Cl.[4] B64C *3/28, 3/36*

U.S. Cl. 244—91 **10 Claims**

1. A high speed aircraft control surface characterized by said control surface including a body portion formed from a heat resistant, lightweight, high strength composite and including a leading portion formed from a heat resistant metal, said leading portion comprising a leading edge portion and a mounting web disposed along substantially the entire leading edge portion, and extending inwardly along said entire leading edge portion a distance of from approximately 25% to 100% of the width of said control surface measured in a direction normal to said

leading edge portion, said web being received within and attached to the interior of said composite, fixing said leading portion to said body portion at a location remove from said leading edge portion.

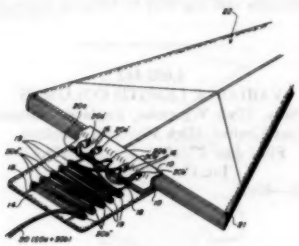


4,693,436

PARACHUTE FLY-AWAY DEPLOYMENT AID

David Gold, deceased, late of Ridgecrest, and Sara Gold, executrix, Glendale, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 15, 1986, Ser. No. 898,154
Int. Cl.[4] B64D *17/76*
U.S. Cl. 244—149 **6 Claims**



4. A method of aiding the deployment of a parachute provided with a plurality of suspension lines connected to a skirt comprising:

securing two flexible panels on diametrically opposed positions on the skirt, the panels each having at least one hole therein;

extending a loop from a flexible apron through the hole on both panels after the panels have been brought together and their holes aligned; and

passing a bight from the suspension lines through the loop thereby securing the panels together and the skirt in a closed position.

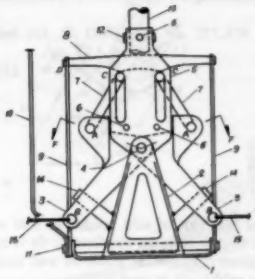
4,693,437

SPOILERON CONTROL MECHANISM

Harry Khachikian, 636 N. Kenwood, Burbank, Calif. 91505

Filed Oct. 11, 1984, Ser. No. 659,943
Int. Cl.[4] B64C *13/04, 13/30, 13/32*
U.S. Cl. 244—225 **3 Claims**

1. A mechanical device, inducing separately or simultaneously braking and rolling effect of an aircraft, and being composed of: a base panel as support for the whole device; two pivot brackets affixed to the said base panel; two bell crank arms supported by a pin on the said pivot brackets and rotating with respect to each other like two scissors blades; a rocker stem pivoting on the same said pivot brackets and being composed of two slotted plates, held together by three spacer studs; a (control) stick, supported in a lug-pin type joint of the said rocker stem and rotating in a plane normal to the rotating plane of the rocker stem; two rocker arms (one on each side) connected with one end to the upper ends of the bell crank arms in a lug-pin joints and having the other ends sliding into the vertical slots provided in the said rocker stem plates.

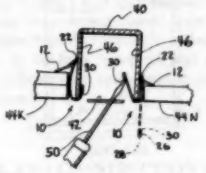


4,693,438

ELECTRICAL BOX RETAINER

Thomas M. Angell, 324 S. Kentucky, Mason City, Iowa 50401

Filed Feb. 10, 1986, Ser. No. 827,426
Int. Cl.[4] H02G *3/12*
U.S. Cl. 248—27.3 **4 Claims**



1. An improved electrical box retainer of a contiguous single piece of relatively thin and soft sheet metal, said retainer having:

(a) an elongate and rectangular generally flat and planar shank;

(b) a leading protrusion on a first and front end of the shank, said protrusion having a nose and a barb;

(c) said nose being upon the shank and being formed by an outside flange folded over and flattened against a portion of the shank, said nose being flattened to a total thickness of less than 2.5 times the thickness of the shank;

(d) said barb being cantilevered and extending rearward and transversely outward from the back of the nose outside flange;

(e) a multiple use catch on an outer and second end of the shank, said of the shank catch being on the same side as the barb and spaced rearward of the barb by a central and elongate length of the shank, said central length being a majority of the length of the retainer.

4,693,439

CAP CARD

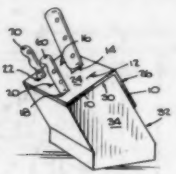
Jerome S. Hahn, Boca Raton, Fla., assignor to Concept Engineering and Design Corporation, Tallahassee, Fla.

Filed Mar. 6, 1986, Ser. No. 836,972
Int. Cl.[4] A47G *21/14*
U.S. Cl. 248—37.6 **15 Claims**

1. A cap card for a holder for at least one knife with a conventional blade, comprising:

a substantially planar material having at least one slot in approximate registry with a corresponding slot in said

holder, said slot in said substantially planar material being slightly narrower than the width of said blade of said knife to be held by said slot in said holder and narrower than the



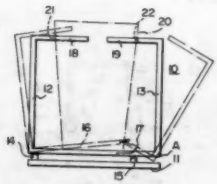
width of said slot of said holder so that when said knife engages said holder, an inteference fit is created between said substantially planar material and said knife thereby securing said knife in said holder.

4,693,440

REFRESHMENT CUP HOLDER

Albert Lalonde, 1045 Connery Ave., Ottawa, Ontario, Canada K1G 2N9

Filed Jul. 7, 1986, Ser. No. 882,690
Int. Cl.[4] A47G *23/02*
U.S. Cl. 248—154 **2 Claims**



1. A device for releasably holding a cup of coffee, bottle of beer or the like refreshment comprising

(a) a base;

(b) a pair of jaw members carried by said base and projecting upwardly therefrom,

(c) means pivotally mounting each of said jaw members on said base so that the free upper ends thereof are movable toward and away from one another respectively to grasp and release a refreshment container therebetween, said pivot mounting of one of said pair of jaw members being so located relative to the centre of gravity of such jaw member that the jaw is biased to an open position, and

(d) a flange secured to and spaced downwardly from the upper free end of the respective jaw members, said flanges extending horizontally toward one another supporting thereon a container of beverage and wherein the flange of said one jaw member underlies and abutts the flange of the other jaw member causing the jaw to be normally open for receiving a container of beverage, said jaw being caused to move to a jaw closed position as a result of placing the container having beverage therein upon said flanges.

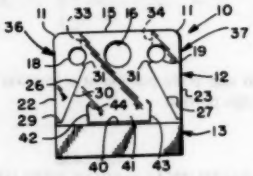
4,693,441

PAD HOLDER AND DISPLAY

Gerald A. Conway, 3133 Fairfax Rd., Cleveland Heights, Ohio 44118

Filed Mar. 25, 1985, Ser. No. 715,355
Int. Cl.[4] F16L *3/08*
U.S. Cl. 248—225.1 **18 Claims**

1. A display clip comprising a flexible but stiff sheet having a circular hole therein, a slit in said sheet leading from a side edge of said sheet and extending upwardly to said hole at an angle to said side edge and inwardly from said side edge to a point beyond a vertical line through the center of the hole and then back to join the lower edge of the hole inwardly of such vertical line whereby upon flexing of said sheet said slit may be opened to provide access to the hole, and means for defining a fold line extending upwardly from said hole to an edge of said sheet whereby a portion of said sheet defined by said slit, hole and fold line may be bent along said fold line to a plane extend-



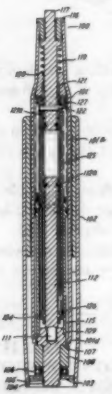
ing at an angle to the plane of the sheet to form a downwardly opening hook extending at such angle to the plane of the sheet, said fold line and slit intersecting said hole such that said portion of said sheet defines a part of the hole which has a lower edge extending upwardly to the point of intersection of said slit with said hole when said portion of said sheet is bent along said fold line, whereby said clip may be hung on wires, rods or the like.

4,693,442

VARIABLE LENGTH COLUMNS

James R. Sills, High Wycombe, England, assignor to DMI Fabrications Limited, High Wycombe, England

Filed Jun. 27, 1986, Ser. No. 879,434
Int. Cl.[4] F16M *11/00*
U.S. Cl. 248—406.2 **13 Claims**



1. A variable length support column comprising first and second elongate members longitudinally slidable together and apart to shorten and to extend the column respectively;

means acting at least indirectly between the first and second elongate members to tend to lengthen the column;

at least one latch member associated with one of the first and second elongate members and displacable to engage against the other of said first and second elongate members at any one of different extensions of the column to lock the column at said extension;

and means for selectively displacing said at least one latch member to lock the column and for releasing said at least

one latch member to permit reverse displacement thereof to free the column, wherein the first of said elongate members is a tubular member slideable over the exterior of the second said elongate member and having at least one aperture therein,

the said at least one latch member is protrudable inwardly through a respective said aperture, and

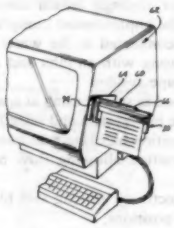
the exterior of said second elongate member is provided with a longitudinally extending series of surface recess formations into which the said at least one latch member is engageable to lock the column.

4,693,443

APPARATUS FOR REMOVEABLY RETAINING SHEET MATERIAL

James M. Drain, Tucson, Ariz., assignor to D. L. West Manufacturing, Inc., Tucson, Ariz.

Filed Feb. 20, 1985, Ser. No. 703,293
Int. Cl.[4] A47F *7/00*
U.S. Cl. 248—447.1 **1 Claim**



1. Apparatus for releasably securing sheet material, said apparatus comprising in combination:

(a) a holder comprising:

(1) means for providing support for the sheet material placed adjacent thereto, said support means including a pair of edges;

(2) a plurality of generally longitudinally aligned rollers for exerting a compressive force against the sheet material placed intermediate said plurality of rollers and said support means to frictionally retain the sheet material with respect to said support means, each of said rollers including a chamfered circumferential edge for discouraging binding interference with adjacent rollers;

(3) means for guiding said plurality of rollers toward and away from said support means in response to the angle with respect to said support means of a pull in force exerted upon the sheet material to increase and decrease, respectively, the friction force retaining the sheet material adjacent said support means; and

(4) planar means extending perpendicularly from said support means for interconnecting said support means with said guiding means;

(b) a mounting for said holder, said mounting comprising:

(1) means for disengageably engaging said support means, said engaging means comprising a pair of opposed channels for receiving said pair of edges;

(2) means for securing said mounting to a surface and;

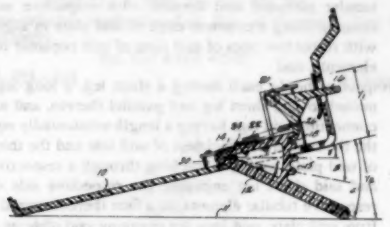
(3) means for pivotally interconnecting said engaging means with said securing means.

4,693,444

HEIGHT ADJUST MECHANISM

Glenn T. Williams, Huntsville, and Michael D. Thomas, Arab, both of Ala., assignors to Intergraph Corporation, Huntsville, Ala.

Filed Jul. 22, 1985, Ser. No. 757,378
Int. Cl.[4] A47F *5/12*
U.S. Cl. 248—653 **17 Claims**



1. Apparatus for adjusting the height of an object comprising:

an object whose height is to be adjusted;

adjustment foot means, pivotally mounted within said object, for raising said object;

adjustment lever means, pivotally mounted within said object, for engaging said adjustment foot means to cause said object to be supported in a raised position; and

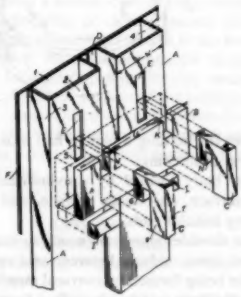
a single spring having a first end coupled to said foot means and a second end coupled to said lever means to simultaneously (a) bias said foot means in a direction to cause said foot means to be fully lowered, and (b) bias said lever means in a direction to cause said lever means to engage said foot means.

4,693,445

CONCRETE AND CONSTRUCTION SYSTEM AND MODULAR PLANK ELEMENT FOR THE CONCRETE FORMWORK THEREOF

Enio Sprecace-Pantoli, Colinas del Tamanaco, Calle Sta. Cruz, Quinta "Enti" Caracas 1061, Venezuela

Filed Jul. 30, 1986, Ser. No. 892,121
Int. Cl.[4] E04G *11/00*
U.S. Cl. 249—19 **13 Claims**



1. A falsework for concrete construction, comprising:

a plurality of plank elements, each having a rectangular sheet having a concrete-facing mold-forming side and a reverse side,

a pair of flat tubular elements affixed to said sheet along opposite longitudinal edges thereof on said reverse side, said tubular elements each having a longitudinally extending outwardly projecting flange, and

a plurality of equally spaced slots formed in a side of each of said elements turned away from said sheet and elongated in the longitudinal dimension of the respective element;

a coupling member interconnecting said plank elements with said flanges disposed in substantially contiguous relationship and two said tubular elements being substantially coplanar, said coupling member being formed as a generally rectangular plate overlying said sides of said coplanar tubular elements and formed with respective notches opening along a common edge of said plate in alignment with respective ones of said slots of said coplanar tubular elements; and

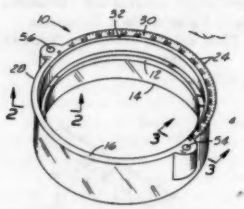
respective hooks each having a short leg, a long leg connected to said short leg and parallel thereto, and an arm connecting said legs having a length substantially equal to the the sum of the thickness of said side and the thickness of said plate, said arm reaching through a respective slot and said short leg engaging the respective side of the respective tubular element on a face thereof turned away from said plate, said long leg engaging said plate on a face thereof turned away from said tubular elements and said arms being received in the respective said notches of said plate.

4,693,446

GASKET FOR MOLDING PLASTIC LENSES

Henry Orlosky, Irvine, Calif., assignor to Techna Vision, Inc., Santee, Calif.

Filed Sep. 20, 1985, Ser. No. 778,321
Int. Cl.[4] B29D *11/00*
U.S. Cl. 249—53 R **8 Claims**



1. A gasket for holding a pair of half molds used in casting plastic lenses, comprising:

an annular body formed by a cylindrical wall having an inside surface, an outside surface, and first and second opposing annular ends,

an annular shoulder along said inside surface of said wall and disposed about midway between said opposing ends, said shoulder being formed by two seal members which extend outwardly from said inside surface from a common junction, and

a pair of diametrically opposed protrusions on said outside surface of the wall, each of said protrusions having a face surface adjacent one of said ends and a passageway extending therethrough, and

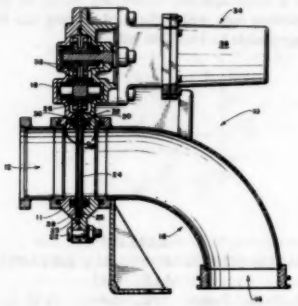
each of said passageways having one end in the face surface of the protrusions through which the passageway extends, and another end extending through said wall and opening at said common junction.

4,693,447

MOTORIZED GATE VALVE FOR A WASTE DISPOSAL SYSTEM

Frederick W. Perez, San Clemente, Calif., assignor to Kaiser Aerospace & Electronics Corporation, Oakland, Calif.

Filed Sep. 16, 1986, Ser. No. 908,003
Int. Cl.[4] F16K *3/04, 31/04*
U.S. Cl. 251—129.12 **9 Claims**



1. In a waste disposal system including a receptacle for receiving waste, a holding chamber for the waste and a waste pipe system communicating between the receptacle and the holding chamber through which waste can be transferred therebetween, the improvement comprising:

valve means connected in the waste pipe system having a hollow housing with an inlet and an outlet cornected to the waste pipe svstem;

a blade disposed in said housing at a substantially right angle to the waste pipe system and selectively movable between a closed position blocking said inlet from said outlet, and an open position allowing flow between said inlet and outlet;

means for selectively moving said blade between the open and closed positions;

a pair of seals disposed in said housing in an abutting relationship aligned to receive therebetween said blade when in the closed position and to seal flow through said inlet and outlet from the interior of said housing when said blade is in the open position;

each of said seals being formed from a resilient elastomer and having a generally D-shaped cross-section with a hollow interior and a gap thereinto, one side wall of each seal having a concave portion adapted to permit said seal to pivot and collapse inwardly into its hollow interior in a mechanical rotation of said seals as said blade is inserted therebetween.

4,693,448

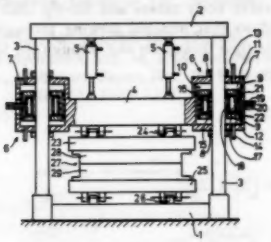
CLOSURE UNIT FOR MOLDING TOOLS

Ferdinand Proksa, Leverkusen; Hans-Michael Sulzbach, Königswinter; Lothar Röhrig, Hennef, and Hans-Wilhelm Fuhrbach, Bonn-Oberkassel, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Hennecke GmbH, Leverkusen, Fed. Rep. of Germany

Filed Oct. 14, 1986, Ser. No. 918,735
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1985, 3538683
Int. Cl.[4] B29C *45/67, 33/24*
U.S. Cl. 249—162 **10 Claims**

1. A molding press having a closure unit comprising: a base which is rigidly connected via at least two columns to a fixed cross head, a lower mold clamping plate arranged on the base, an upper mold clamping plate arranged on a movable cross head which is attached by a mounting to each of said columns, the clamping plates facing one another, and actuating means

including a hydraulic cylinder which surrounds said column in which a piston surrounding the column is arranged, said piston being an arrestable drag piston and the hydraulic cylinder



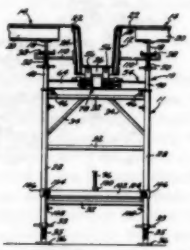
being a short lift cylinder, said upper clamping plate being movable by means of at least two long lift cylinders arranged between said fixed cross head and said movable cross head.

4,693,449

BEAM FORM AND SLAB FORM ADJUSTMENT STRUCTURE

Arthur L. Cunningham, 6055 Windemere Way, Riverside, Calif. 92506

Filed Oct. 24, 1985, Ser. No. 790,864
Int. Cl.[4] E04G *1/20*
U.S. Cl. 249—210 **10 Claims**



1. A beam form and slab form adjustment structure adapted for mounting to a shoring frame having a pair of upstanding tubular legs, said structure comprising:

longitudinally extending beam form support means includig first hinge means;

an elongated transverse beam including second hinge means cooperative with said first hinge means

to define a transverse pivot axis located above said beam and to enable upward pivotal movement of said transverse beam toward said beam form support means and about said transverse axis to facilitate transport of said beam form support means to a different site;

lateral adjustment means operative upon said transverse beam and said beam form support means for adjusting the lateral position of said beam form support means relative to said transverse beam;

a pair of slab form support means carried by said transverse beam and including a pair of supports for engaging slab forms and a pair of height adjusting means mounting said supports, respectively; and

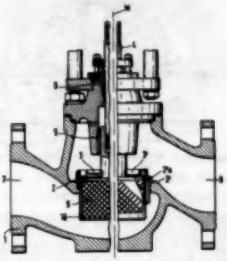
depending portions supported by said transverse beam and telescopably and removably receivable within the upper ends of said legs of said shoring frame, respectively, said pair of height adjustment means being operable to adjust the vertical position of said pair of supports relative to said depending portions said depending portions being operative to transfer loads from said transverse beam to said shoring frame solely through said upper ends of said legs.

4,693,450

LOW-NOISE CONTROL VALVE

Herbert K. Paetzel, Nettetal-Hinsbeck, Fed. Rep. of Germany, assignor to Masoneilan International, Inc., Dallas, Tex.

Filed Jun. 6, 1986, Ser. No. 871,706
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520555
Int. Cl.[4] F16K *47/02*
U.S. Cl. 251—121 **3 Claims**



1. In a low noise upper control valve with a housing, in which a valve cone is arranged which can be moved in relation to a valve seat for closing or opening the passageway of the medium and which possesses a connecting piece for inflow and a connecting piece for outflow, and in which inside of the housing in the passageway of the medium a noise-attenuating element is arranged and inside of this element the passageway of the medium is divided into a multitude of sub-paths and the cross sections of passage of the sub-paths are small as compared to the cross section of passage of the valve, an improved noise attenuating element, comprising:

lamellas which touch one another and are arranged over the entire cross section of the passage parallel to each other and parallel to the direction of flow, the lamellas being corrugated, with the directions of the corrugations proceeding obliquely with respect to the direction of flow and the directions of the corrugations of two adjacent lamellas intersecting each other;

the valve cone having a hollow-cylindrical extension which extends in the direction of closing, passes through the valve seat in a tight manner and is open at the free end and in which extension the nosie attenuation element is arranged and at least one opening for the medium is arranged in the cylindrical surface of the extension so that when the valve cone is lifted off, the medium flows exclusively through the noise attenuation element; and

the element having a ratio of length to diameter in a range up to a maxium of two.

4,693,451

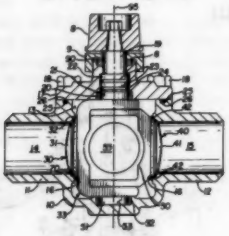
VALVE STRUCTURES

John D. Tricini, Greensburg, Pa., assignor to Valve Systems, Inc., Pittsburgh, Pa.

Filed Oct. 17, 1986, Ser. No. 920,115
Int. Cl.[4] F16K *5/00*
U.S. Cl. 251—163 **7 Claims**

1. A valve structure comprising a housing having an open top valve chamber and inlet and outlet passages on opposite sides of the valve chamber forming a through passage with the valve chamber through said housing, a generally spherical radius valve seat on each passage at the valve chamber, a bonnet removably covering said chamber, a stem extending through said bonnet generally axially of the valve chamber, said stem including a middle stem portion of generally rectan-

gular shape having an annular opening therethrough, a pair of generally spherical radius closure discs in the valve chamber sealingly adapted to engage the valve seats, each said disc having an annular beveled sealing surface, an annualr groove in said sealing surface, a resilient seal ring in said groove, a disc carrier of generally U-shape for each disc in the valve chamber, each disc carrier having a through passage in a plane transverse to the plane of the disc providing full flow therethrough from the inlet to the outlet passage when the valve is in opening position, eccentric means provided on said stem and



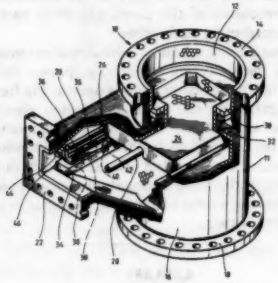
engaging each disc carrier for selectively moving the discs simultaneously into and out of engagement with the valve seats and guide means between the bonnet and at least one of said disc carriers guiding the disc carriers on rotation of the stem from an open position in which the through passages in the disc carrier provides free flow between the inlet and outlet passages and a closed position in which the discs are aligned with the valve seats and holds the disc carriers in that position while the eccentric means moves the discs selectively axially into and out of engagement with the valve seats.

4,693,452

VALVE

Jandrasi Frank J., Houston, Tex., assignor to Triten Corporation, Houston, Tex.

Filed Mar. 12, 1986, Ser. No. 839,003
Int. Cl.[4] F16K *3/316*
U.S. Cl. 251—329 **15 Claims**



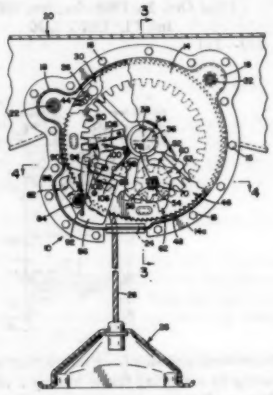
1. A valve, the valve having
body means,
the body means having
inlet means,
outlet means, and
disc means,
the disc means disposed within the body means and movable to close off or open the valve,
the disc means movably mounted on guide means, the guide means secured to the interior of the body means,
the guide means having slot means therethrough for conducting through the guide means material falling thereon, and
the guide means mounted on shelf means for supporting and mounting the guide means, the shelf means mountable to the valve body means and having shelf slot means disposed so that material flowing through the guide slot means then flows into and through the shelf slot means.

4,693,453

CABLE DRUM LATCHING AND UNLATCHING MECHANISM

Steve D. Ivan, St. Clair Shores, Mich., assignor to Wickes Manufacturing Company, Southfield, Mich.

Filed May 19, 1986, Ser. No. 864,544
Int. Cl.[4] B62D *43/04*; B66D *1/06, 5/34*
U.S. Cl. 254—323 **18 Claims**

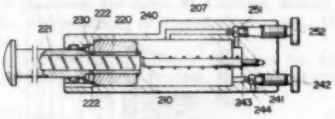


1. A cable winding and unwinding mechanism comprising cable drum means having a drum axis, a cable having one end connected to said drum means and having a free end, support means supporting said drum means for rotation in opposite directions about said drum axis, drum drive means rotatable in opposite directions about a fixed drive axis, one of said opposite directions of each said drum means and said drive means being a cable winding direction and the other a cable unwinding direction, drum holding means displaceable between holding and release positions respectively holding said drum means against rotation in said unwinding direction and releasing said drum means for rotation in said unwinding direction, and actuator means separate from said drive means and said holding means and mounted on said support means for displacement between first and second positions respectively corresponding to said holding and release positions, and said drive means including means to actuate said actuator means for displacement between said first and second positions respectively in response to rotation of said drive means in said winding and unwinding directions about said drive axis to alternately displace said holding means between said holding and release positions.

4,693,454
AIR PRESSURE SHOCK ABSORBER

Tatsuo Tsuchiya, and Kazuhiro Hozumi, both of Asahi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma and Kuroda Precision Industries Ltd., Kawasaki, both of, Japan

Continuation of Ser. No. 331,752, Dec. 17, 1981, Pat. No. 4,500,075. This application Aug. 16, 1984, Ser. No. 641,394
Claims priority, application Japan, Dec. 18, 1980, 55-179176
Int. Cl.[4] F16F *1/06*
U.S. Cl. 267—226 15 Claims

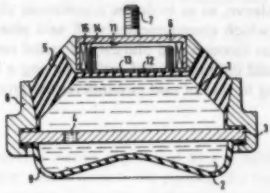


1. An air pressure shock absorber comprising:
a cylinder defining a first opening at one end of said cylinder;
a chamber defined by the cylinder, said chamber having a forward chamber portion, an intermediate chamber portion and a rear chamber portion;
a piston slidably mounted in said chamber and initially positioned in said rear chamber portion;
a piston rod mounted on said piston, said piston rod extending from the cylinder through said first opening;
spring means located in the cylinder for returning the piston to its initial position in the rear chamber portion by a pressing force after the piston has moved from the rear chamber portion to the forward chamber portion;
a second opening solely defined by an inner wall of the cylinder at the forward chamber portion;
a third opening solely defined by the inner wall of the cylinder at the intermediate chamber portion;
an air inlet passage defined by the cylinder freely communicating between the rear chamber portion and the atmosphere, said air inlet passage being constructed and arranged such that only air is continuously drawn into the chamber behind the piston as the piston moves from the rear chamber portion to the forward chamber portion;
an air exhaust passage defined by the cylinder communicating with the forward chamber portion and the atmosphere, said air exhaust passage being constructed and arranged such that only air is continuously compressed ahead of the piston as the piston moves from the rear chamber portion to the forward chamber portion to produce an area which has an air pressure higher than an area behind the piston;
a bypass passage defined by the cylinder freely communicating between said second opening and said third opening, said bypass passage rapidly releasing air compressed ahead of the piston in the forward chamber portion to increase the air pressure of the rear chamber portion behind the piston when the piston moves a predetermined distance in a direction from the rear chamber portion to the forward chamber portion to position the piston past said third opening and before said second opening due to a force pushing on an end of the extended piston rod;
said piston rod being hollow and its interior communicating with the forward chamber portion, said piston being slidable on said piston rod so as to control at least one radial hole which is provided in said hollow piston rod and which is thereby opened to the rear chamber portion and thus to the atmosphere; and
a retaining ring being provided at the end of said piston rod to retain said piston thereon, and wherein the spring means acts on said piston rod so that the at least one radial hole is opened by said piston when said piston rod is returned by said spring means but is closed when said piston is displaced in the forward direction by said piston rod.

4,693,455
TWO-CHAMBER MOTOR SUPPORT WITH HYDRAULIC DAMPING

Rainer Andrä, Limburg, Fed. Rep. of Germany, assignor to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

Filed May 24, 1985, Ser. No. 738,165
Claims priority, application Fed. Rep. of Germany, May 24, 1984, 3419437
Int. Cl.[4] F16F *15/02*
U.S. Cl. 267—140.1 7 Claims

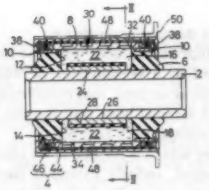


1. Two-chamber engine mount with hydraulic damping, comprising a housing having rubber-elastic peripheral walls and an engine side to be connected to an engine, an intermediate plate dividing said housing into fluid-filled chambers being in communication with each other through a penetration formed in said intermediate plate, an active electro-dynamic vibration generator being integrated into one of said fluid-filled chambers closest to said engine side and being controllable in dependence on predetermined operating parameters, a membrane chamber disposed in said one fluid-filled chamber closest to said engine side, and a membrane with a quenching mass closing off said membrane chamber, said vibration generator being an electro-dynamically operating vibration generator with an active vibrating part formed by said membrane and said quenching mass.

4,693,456
FLUID-FILLED RESILIENT BUSHING WITH CIRCUMFERENTIAL ORIFICE

Ryouji Kanda, Inuyama, Japan, assignor to Tokai Rubber Industries, Ltd., Aichi, Japan

Filed Sep. 11, 1986, Ser. No. 906,197
Claims priority, application Japan, Sep. 18, 1985, 60-142639[U]
Int. Cl.[4] F16F *5/00*
U.S. Cl. 267—140.1 10 Claims



1. A fluid-filled resilient bushing, comprising:
an inner sleeve having a cylindrical outer surface;
a generally annular resilient member secured by vulcanization to the outer surface of said inner sleeve in co-axial relation with each other, and having a plurality of pockets which are open in an outer surface of the resilient member, said plurality of pockets being spaced from each other in a circumferential direction of the resilient member;
an orifice sleeve positioned radially outward of said resilient member, and closing said plurality of pockets formed in said resilient member, thus cooperating with said resilient member to define a plurality of fluid chambers corresponding to said pockets, said orifice sleeve having a

circumferential groove formed continously in an outer surface thereof so as to cover at least one full circumference of said orifice sleeve, and a plurality of radial communication holes which communicate at their outer ends with said circumferential groove and at their inner ends with said plurality of fluid chambers, respectively, said fluid chambers being filled with an incompressible fluid; and

an outer sleeve fitted on the outer surface of said orifice sleeve, and closing said circumferential groove in said orifice sleeve, so as to define a continous circumferential orifice which communicates with said plurality of fluid chambers through said plurality of radial communication holes, said circumferential orifice having a length corresponding to that of said circumferential groove.

4,693,457

VIBRATION DAMPER

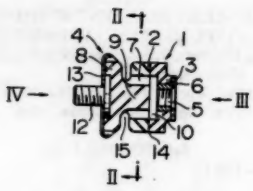
Yoshikiyo Kamata, Hachioji, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Continuation of Ser. No. 711,051, Mar. 12, 1985, abandoned. This application Sep. 8, 1986, Ser. No. 904,862

Claims priority, application Japan, Mar. 21, 1984, 59-40329[U]

Int. Cl.⁴ F16F *1/54*

U.S. Cl. 267—153 **4 Claims**



1. A vibration damper comprising:

a hollow cylindrical member which is formed of an elastic material and to a bottom end of which an outwardly facing fixture is secured, said cylindrical member defining a bore with a radial bore wall therein, said fixture being essentially coaxial with said bore;

a plug member which is formed of an elastic material which has an integral, radially extended flanged head portion with another outwardly facing fixture secured thereto, said flanged head portion having a diameter larger than the inside diameter of said cylindrical member and said plug member having a integral neck portion within said bore of said cylindrical member, space being defined between said neck portion and a bottom end of said bore of said cylindrical member, the flanged head portion being disposed away from said cylindrical member in the axial direction such as to form spaces therebetween; and

an elastic connecting member for integrally connecting said cylindrical member and said plug member said elastic member defining a plurality of spaces between said plug member and said bore wall of said hollow cylindrical member.

4,693,458

CLAMPING ARRANGEMENT FOR LUMBER ELEMENTS

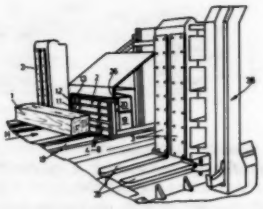
Ernst Lewecke, Lemgo, and Manfred Riesenberg, Horn-Bad Meinberg, Fed. Rep. of Germany, assignors to Lewecke Maschinenbau GmbH, Blomberg, Fed. Rep. of Germany

Filed Nov. 24, 1986, Ser. No. 934,194

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1986, 3635716

Int. Cl.⁴ B25B *11/00*

U.S. Cl. 269—21 **16 Claims**



1. An arrangement for clamping a lumber element during its processing, especially in a sawing installation, comprising

at least two spaced abutment members having abutment surfaces for the lumber element;

a substantially vertically extending suction plate situated between said abutment elements and including an upright contact plane, said suction plate being movable transversely to said contact plane, and having a plurality of suction openings capable of exerting suction effects on the lumber element which is juxtaposed with the contact plane;

sensing means including a plurality of contactless sensors for sensing the presence of the lumber element at the respective suction openings and for generating corresponding indication signals; and

means for controlling the suction effect of said suction openings in dependence on said indication signals.

4,693,459

SHEET FEEDING SYSTEM IN RECORDING APPARATUS

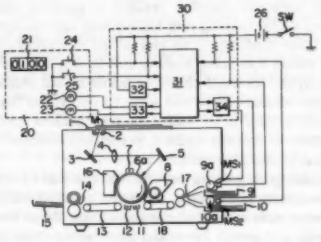
Kazuho Shimoda, and Shunichi Abe, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 478,805, Mar. 25, 1983, abandoned, which is a continuation of Ser. No. 210,137, Nov. 24, 1980, abandoned. This application Dec. 24, 1985, Ser. No. 814,289

Claims priority, application Japan, Nov. 26, 1979, 54-151992

Int. Cl.⁴ B65H *3/44*

U.S. Cl. 271—9 **5 Claims**



1. An electrophotographic copying machine wherein recording paper is supplied to an image transfer mechanism from

one of at least two cassettes comprising means for manually changing a selection of a first cassette from which paper is to be supplied, sensing means for detecting a replacement of a second cassette, and controlling means, responsive to signals from said sensing means, for effecting supply of paper to the image transfer mechanism from a replaced cassette irrespective of the prior selection of said first cassette by said manual selecting means.

4,693,460

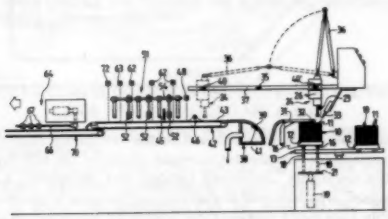
AUTOMATIC GARMENT PORTION LOADER

Fletcher D. Adamson, and James M. Caldwell, both of Alexander City, Ala., assignors to Russell Corporation, Alexander City, Ala.

Division of Ser. No. 803,416, Dec. 2, 1985, Pat. No. 4,633,604. This application May 12, 1986, Ser. No. 861,826

Int. Cl.[4] B65H *5/00*

U.S. Cl. 271—10 **5 Claims**



1. Apparatus for loading fabric garment portions onto an automated production line wherein each of said garment portions are moved along a plurality of tandem conveyors and each said garment portion is required to have one edge thereof aligned at a predetermined line relative to said plurality of conveyors, comprising:

(a) means for placing individual garment portions on one of said plurality of conveyors at a predetermined position and in a substantially foldless manner;

(b) means responsive to the position of said one edge of said garment portion relative to said predetermined line for urging said garment portion toward said predetermined line with said means for urging being operable only during a specified time; and

(c) means responsive to the position of said one edge of said garment portion relative to said predetermined line at the end of said interval of time for removing misaligned garment portions from the production line.

4,693,461

PAPER SPEED CONTROL IN AUTOMATIC DOCUMENT FEEDER

Kozo Takahashi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 24, 1986, Ser. No. 822,213

Claims priority, application Japan, Jan. 30, 1985, 60-17975

Int. Cl.[4] B65H *29/68*

U.S. Cl. 271—176 **4 Claims**

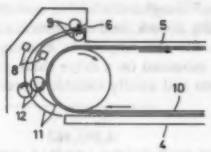
1. An automatic document feeder suitable for an electrophotographic copying machine comprising:

document table means for the placement of documents thereon;

document receiving means for receiving said documents for copying;

document discharge portion of said document feeder, provided adjacent said document receiving means, for discharging said document, said discharge portion comprising a document guide, transport means, sensor means and document discharge means, said sensor means, for detecting the transport of said documents, being positioned between said transport means and document discharge means;

document transport means for automatically transporting said documents from said document table means to said document receiving means to said document discharge portion; and



speed reduction means responsive to a condition whereby said sensor means detects the passing of a trailing edge of said transported document, to thereby reduce the speed of said document discharge means.

4,693,462

SHEET DELIVERY APPARATUS FOR PRINTING MACHINES

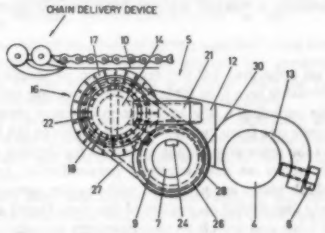
Gerhard Pollich, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelber, Fed. Rep. of Germany

Continuation of Ser. No. 21,954, Mar. 19, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 218,544

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1978, 2811963

Int. Cl.[4] B65H *29/68*

U.S. Cl. 271—183 **4 Claims**



1. In sheet delivery apparatus for printing machines having a chain delivery device for delivering printed sheets to a delivery pile, pneumatic braking means comprising a plurality of discrete braking roller devices each having means for admitting suction air thereto and respectively having a sheet supporting surface of given width for supporting a printed sheet at non-printed areas thereof, a support shaft extending between side walls of the printing machine adjacent and upstream of the delivery pile in travel direction of the chain delivery device, said support shaft being disposed transversely to said travel direction below the chain delivery device, said plurality of discrete braking roller devices being mounted on said support shaft with the respective sheet supporting surfaces thereof engageable with respective non-printed areas of the sheet for braking and tightening the sheet, the respective sheet supporting surfaces being on respective parts of said braking roller devices which are continuously movable together with the sheet supported thereby in said travel direction of the chain delivery device, said plurality of braking roller devices being each individually exchangeable in the entirety thereof for other respective discrete braking roller devices having sheet supporting surfaces differing in width from said given width

thereof so as to match varying widths on non-printed areas on respective printed sheets, the sheet supporting surface of differing width being on respective parts of said other discrete braking roller devices which are continuously movabhle together with the sheet supported thereby, said braking roller devices being of unipartite construction and comprising respective braking rollers formed in a sheet supporting surface thereof with suction chambers recessed therein and having a suction-air feed integral therewith, and drive means for rotating said braking rollers, said drive means comprising separate drive wheels for the respective braking rollers, said drive wheels being mounted on a drive shaft, fixed against rotation relative thereto and axially slidable thereon.

4,693,463

APPARATUS FOR THE LATERAL REGISTRATION OF SHEETS

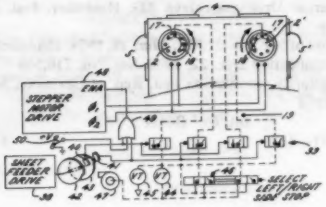
Adolf Schwebel, Offenbach am Main, and Herbert Herrmann, Obertshausen/Hausen, both of Fed. Rep. of Germany, assignors to Mabeg Maschinenbau GmbH & Company, Offenbach am Main, Fed. Rep. of Germany

Filed Apr. 1, 1986, Ser. No. 846,873

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1985, 3511897

Int. Cl.[4] B65H *9/00*

U.S. Cl. 271—236 **14 Claims**



1. In an apparatus for the registration of sheets in a sheet stream feedable on a feed table of a sheet treating machine, said feed table including a first and a second suction plate arranged at a distance one from another at right angles to the feed direction, and the apparatus including means for driving each plate rotatably about an axis arranged perpendicular to the feed table, which plates are provided with suction openings which are evenly distributed on a plane of the plate facing away from the feed table and which suction openings are subjected to air suction, enabling the respective frontmost sheet of the sheet stream to be grasped in the region of its leading edge and enabling the sheet to be moved to lie against a side stop and/or a front stop, the improvement comprising providing means enabling the suction plates to be rotatably driven in opposite rotational senses and providing means for selectively applying suction either to the suction openings located momentarily relative to the feed direction to the rear outward facing quadrants or to the suction openings located momentarily relative to the feed direction in the front inward facing quadrants.

4,693,464

APPARATUS FOR ARRANGING THE OBVERSE AND REVERSE SIDES OF THE BILLS OR THE LIKE

Nobuyuki Honma, Matsudo, Japan, assignor to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1985, Ser. No. 800,384

Claims priority, application Japan, Dec. 20, 1984, 59-193501[U]; Dec. 21, 1984, 59-194028[U]

Int. Cl.[4] B65H *5/26*

U.S. Cl. 271—265 **5 Claims**

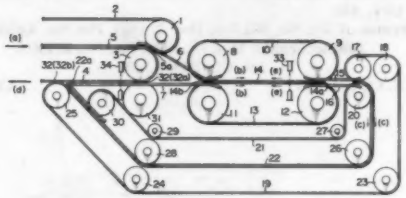
1. An apparatus for arranging the obverse and reverse sides of bills or the like comprising:

a carrying-in passage for carrying in bills or the like with their obverse and reverse sides in the mixed state,

a reversibly conveying passage for receiving said bills or the like therein from said carrying-in passage and conveying said bills or the like forward or backward,

a carrying-out passage for carrying out said bills or the like, arranged in alignment with said reversibly conveying passage so that said reversibly conveying passage and said carrying-out passage form a linear passage,

a return conveying passage for receiving said bills or the like transferred forward from said reversibly conveying passage and transferring said bills or the like to said carrying-out passage,



first sensing means positioned in the reversibly conveying passage for sensing the presence of one of the bills within the reversibly conveying passage and generating a first signal, which is used to control the changing of the reversibly conveying passage from a forward movement state to a backward movement state, and

second sensing means positioned in the carrying-out passage for sensing the presence of one of the bills within the carrying-out passage and generating a second signal, which is used to control the changing of the reversibly conveying passage from the backward movement state to the forward movement state.

4,693,465

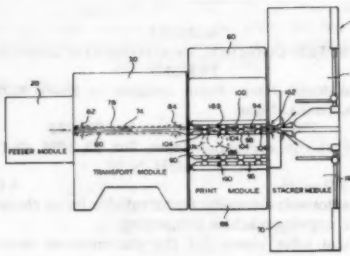
ROTATABLE PRINT MECHANISM FOR PRINTING ON FRONT OR BACK OF MEDIA

Eduard Svyatsky, Chicago, and K. George Rabindran, Morton Grove, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Continuation of Ser. No. 668,140, Nov. 5, 1984, Pat. No. 4,561,352. This application Sep. 9, 1985, Ser. No. 774,234

Int. Cl.[4] B65H *5/06*

U.S. Cl. 271—274 **2 Claims**



1. A document transport for a document printing system for moving documents serially past a print head which prints information entered by an operator on each document, comprising:

a table;

a document drive assembly for transporting said documents across said table, said document drive assembly including

a frame, a motor mounted on the frame, a plurality of document driving pulleys arrayed linearly on the frame, and a belt for connecting the document driving pulleys to the motor;

mounting means for pivotally mounting the document drive assembly to the table including horizontal hinge means at one end of said document drive assembly for pivotally connecting the document drive assembly to the table, and a latch at the other end of said document drive assembly for releasably attaching the document drive assembly to the table;

an outer document transport housing including a plurality of rotatable pressure rollers arrayed linearly in the housing, the rotatable pressure rollers and the plurality of document driving pulleys forming the document path of the document transport assembly;

said outer document transport housing further including vertical hinge means at one end of said housing for pivotally connecting the housing to the table, and a latch at the other end of the housing for releasably attaching the housing to the table.

4,693,466

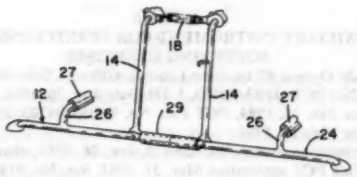
OSCILLATING DEVICE HAVING IMPROVED SUPPORT LEGS AND DEMOUNTABLE BASE

Robert C. Swengel, Sr., York, Pa., assignor to Donsco Inc., Wrightsville, Pa.

Continuation-in-part of Ser. No. 629,334, Jul. 10, 1984, Pat. No. 4,575,071, which is a continuation-in-part of Ser. No. 726,226, Apr. 22, 1985. This application Oct. 21, 1985, Ser. No. 789,439

Int. Cl.[4] A63G *17/00*

U.S. Cl. 272—52 **2 Claims**



1. An oscillating device including a base and a pair of front and rear leg members each having their lower ends pivotally connected to the base while the upper ends of the leg members are pivotally disposed in bearing members as part of a support member of the oscillating device, spring members extending between the upper ends of the leg members holding them within the bearing members, said base characterized in that:

said base is formed of a pair of horizontal members interconnected by transverse members, said horizontal members include front and rear sections with the lower ends of the front leg members being pivotally connected to the front sections of the horizontal members and the lower ends of the rear leg members being pivotally connected to the rear sections of the horizontal members thereby forming said base into front and rear halves, the front end of said rear section and the rear end of said front section forming inner ends of the respective front and rear sections; and

means for maintaining said inner ends of the front and rear sections of the horizontal members in engagement by said spring members and including loose sleeve means in which the inner ends of the horizontal members are disposed when the front and rear halves are assembled into said base for operation of the oscillating device;

said sleeve means having a cross-sectional configuration corresponding to that of said inner ends and being of a length substantially corresponding to that between the pivot connections of the lower ends of the leg members to said horizontal members.

4,693,467

SPRING STRUCTURE INTENDED SPECIFICALLY FOR PLAY OR EXERCISE APPARATUS

Antero Ikäheimo, Rovaniemi, Finland, assignor to Pohjoiskalotti Oy, Rovaniemi, Finland

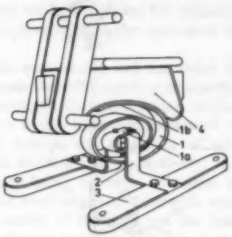
PCT No. PCT/FI85/00004, § 371 Date Sep. 3, 1985, § 102(e) Date Sep. 3, 1985, PCT Pub. No. WO85/03010, PCT Pub. Date Jul. 18, 1985

PCT Filed Jan. 7, 1985, Ser. No. 777,693

Claims priority, application Finland, Jan. 9, 1984, 840075

Int. Cl.[4] A63G *17/00*

U.S. Cl. 272—52 **5 Claims**



1. A spring structure intended particularly for a play and exercise apparatus, comprising:

a helical spring member made of flat steel material with sides, a predetermined width and turns, said helical spring member having an inner end and an outer end, said outer end being adapted for attachment to a movable member;

a brace member also made of flat steel material and having an essentially U-shaped middle portion, said U-shaped middle portion including arm portions and a substantially horizontal web portion centrally disposed within said U-shaped middle portion and having a predetermined length;

said inner end of said helical spring member being secured to and across said web portion wherein the predetermined length of the web portion is greater than the predetermined width of said helical spring member;

said arm portions of the brace member extending along the sides of the helical spring in a general direction away from said outer end and beyond an outermost turn of the spring member;

a fastening base, said fastening base being substantially horizontally positioned and said inner and outer ends of said helical spring being substantially horizontal with said inner end being affixed to said web portion and said outer end being disposed adjacent to said inner end and spaced apart by turns of said helical spring with said outer end being affixed to said movable member; and

outer ends of said arm portions being bent outwardly in a substantially horizontal position, said outer ends lie essentially in the same plane, said outer ends are fastened to said fastening base for supporting the spring structure.

4,693,468

EXERCISE MACHINE HAVING PEDALS WHICH EXTEND RADIALLY AGAINST RESISTIVE MEANS

Paul C. Kurlytis, 5485 Desert La., Silver Springs, Nev. 89429, and Clayton A. Carpenter, 1175 Yates La., Reno, Nev. 89509

Continuation-in-part of Ser. No. 708,233, Mar. 5, 1985, abandoned. This application Aug. 13, 1985, Ser. No. 765,559

Int. Cl.[4] A63B *21/00*; G05G *1/14*

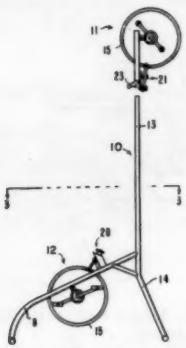
U.S. Cl. 272—73 **5 Claims**

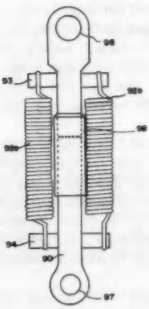
1. An exercise machine for providing extended exercise for the forward and backward muscles of the lower muscle group, comprising:

a frame for supporting at least one bidirectional rotational exercise assembly for exercising the forward and back-

ward muscles of the lower group in a standing position; and

a bidirectional exercise assembly mounted on said frame, said assembly including a central axle having portions extending on either side of said frame, a shank attached to each of said portions of said axle, each of said shanks having a foot pedal attached thereto opposite the end attached to said axle, each of said shanks comprising a first member which is slidably inset within a second member and wherein said first member and said second member





are connected by a spring having a bias strength greater than 200 lbs/inch which holds said first member in a fully seated position within said second member whereby said first member slides outwardly from within said second member when the operator of said exercise machine applies a force to said pedal which exceeds the strength of said spring, said means being extended in the segment of the pedalling cycle from 90° to 270°, whereby the operator in a standing position may exercise said forward and backward muscles of the lower muscle group through an extended range.

4,693,469

AEROBIC EXERCISE DEVICE

Larry Cedar, P.O. Box 319, Van Nuys, Calif. 91408-0319

Filed Nov. 6, 1986, Ser. No. 927,399

Int. Cl.[4] A63B *5/22*

U.S. Cl. 272—74 **15 Claims**

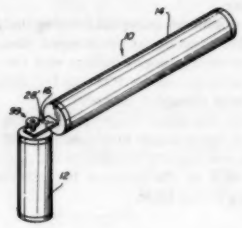
1. An aerobic exercise device for use in simulating rope-jumping and other exercises, comprising:

a handle means for gripping the device comprising a first end and a second end spaced from said first end;

a weight means having a first end and a second end spaced from said first end thereof, said first end thereof being closer to said second end of said handle means than said second end of said weight means;

flexible means having a first end connected with said handle means and a second end operatively associated with said weight means for interconnecting said handle means in spaced apart relationship with said weight means;

said handle means comprising an outer circumferential surface portion, and means mounting said first end of said



flexible means for rotation relative to said handle means so that said weight means may be revolved about said handle means as said handle means is revolved;

said weight means comprising a substantially hollow tubular element, said flexible means comprising an elongated, axially-stretchable, resilient cord means having an outer diametric extension less than the inner diametric extension of said hollow tubular element, said cord means extending through said hollow tubular element.

4,693,470

AUXILIARY INSTRUMENT FOR STRETCHING AND SOFTENING EXERCISES

Takashi Ogawa, 97 Imolima-1 chome, Gifu-shi, Gifu 500, Japan

PCT No. PCT/JP83/00103, § 371 Date Jun. 26, 1984, § 102(e) Date Jun. 26, 1984, PCT Pub. No. WO84/01723, PCT Pub. Date May 10, 1984

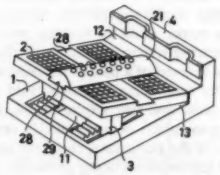
Continuation of Ser. No. 626,870, Jun. 26, 1984, abandoned.

This PCT application Mar. 31, 1983, Ser. No. 919,599

Claims priority, application Japan, Oct. 27, 1982, 57-162602; Dec. 21, 1982, 57-225464

Int. Cl.[4] A63B *23/04*

U.S. Cl. 272—96 **1 Claim**



1. An auxiliary instrument for stretching and softening exercises comprising a supporting base positionable on a horizontal surface, a single treading base wide enough to completely support both of the user's feet having a flat top surface on which a user stands with a user's feet being supported by said surface, said treading base being hinged at one end to said supporting base so as to be free to rotate between a closed position and several locked open positions relative to said supporting base, an angle adjusting member interposed between said supporting base and treading base to keep said treading base at a selected one of said several open positions and a stopper erected immediately adjacent said treading base in the region where said treading base is hinged to said support-

ing base said stopper adapted to engage the user's heels so that the feet rest entirely on said treading base.

4,693,471

RESILIENT SUPPORT

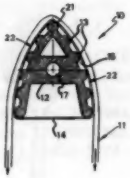
Andrew W. R. Dofel, Castle Hill, Australia, assignor to Supafit Gymnasium Equipment Pty, Limited, Castle Hill, Australia

Filed Aug. 22, 1985, Ser. No. 768,519

Claims priority, application Australia, Aug. 22, 1984, PG6714

Int. Cl.[4] A63B *21/04*; B65H *23/04*

U.S. Cl. 272—136 **11 Claims**



6. In combination a support **10**, and an elongated, resilient exercise element **11**, said support comprising:

a generally rigid body **12** having an external peripheral surface adapted to support the resilient exercise element **11** along the periphery of said surface a passage **17** disposed in body **12** to secure the support **10** to a mounting means; and

a resilient sleeve **14** adapted to cover the peripheral surface sandwiched between the body **12** and the exercise element **11**, and to move resiliently with the exercise element **11** relative to the body **12**.

4,693,472

BALL REBOUND NET

Vernon H. Newman, 107 Hazel Road, Lakes Entrance, Victoria 3909, and Roland Becker, 26 Munro Street, Brighton, Victoria 3186, both of Australia

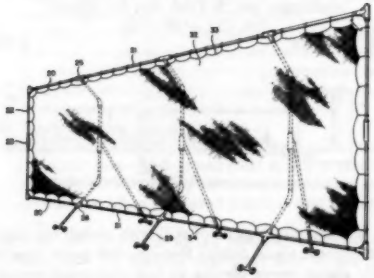
PCT No. PCT/AU84/00104, § 371 Date Feb. 8, 1985, § 102(e) Date Feb. 8, 1985, PCT Pub. No. WO85/00019, PCT Pub. Date Jan. 3, 1985

PCT Filed Jun. 15, 1984, Ser. No. 705,335

Claims priority, application Australia, Jun. 15, 1983, PF9819; Jun. 16, 1983, PF9846; Dec. 8, 1983, PG2755

Int. Cl.[4] A63B *69/40*

U.S. Cl. 273—29 A **10 Claims**



1. A ball rebound assembly, comprising

(a) a generally rectangular frame including generally horizontal and vertical frame members;

(b) means supporting said frame in a generally upright positin;

(c) a high-tensile net arranged within said frame and including threads interconnected to define a mesh having at the net periphery a plurality of mesh apexes;

(d) a high-tensile perimeter cord threaded in and out through the apexes of the meshes around the periphery of said net, thereby to cause said cord to assume an arcuate configuration between successive connection points, whereby the arc radius increases with increasing cord tension, and vice versa;

(e) means connecting said net to said frame via said cord to cause the rebound assembly to rebound a ball with less than twenty percent loss of kinetic energy, said connecting means including:

(1) a plurality of generally inextensible elements connected between said cord and said frame, respectively,

(2) said elements including means for adjusting the position of the cord relative to the associated frame member,

(3) said elements maintaining said net under high tension with the threads thereof extending obliquely relative to said frame members, thereby forming, when the assembly is in use, a highly-tensioned system of substantially equal square meshes the diagonals of which extend vertically and horizontally, respectively,

(4) said elements being operable to adjust the relative position of the cord engaged therewith, and hence the local configuration of the cord and the balancing tensions in the threads meeting and joined at the apexes through which the cord is threaded,

(5) said connecting elements being so distributed around the frame and so fastened and arranged as to provide the desired tensions in the locally-terminating threads and in impact areas corresponding to intersections of contiguous threads.

4,693,473

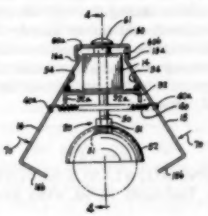
GOLF BALL RETRIEVER

Eldon E. Miller, 126 Meadow La., Solon, Ohio 44139

Filed Nov. 12, 1985, Ser. No. 796,893

Int. Cl.[4] A63B *57/00*

U.S. Cl. 273—32 F **7 Claims**



1. A ball retriever comprising:

an elongated handle;

ball capturing means mounted at one end of the handle, said ball capturing means including a rigid support fixed with respect to the handle, first and second arms, each of said first and second arms comprising a planar member pivotally coupled to the rigid support and movable between an open and a closed position, each planar member including a ball capturing portion angled at one end with respect to a support engaging portion to close about a ball in said closed position and angled at an opposite end of the support engaging portion to define a latch engaging portion;

resilient biasing means to continuously bias said arms to a closed position; and

trigger means mounted to the ball capturing means for movement with respect to the ball capturing means, said trigger means including a contoured member for contacting the ball and a latching member for engaging the latch engaging portion of said arms to hold said arms in an open

position, said contoured member rigidly connected to said latching member so that movement of the trigger means releases the latch engaging portion of said arms from the latching member causing said resilient biasing means to close said arms about said ball and secure said ball within the contoured trigger member and said arms.

4,693,474

GAMES RACKET

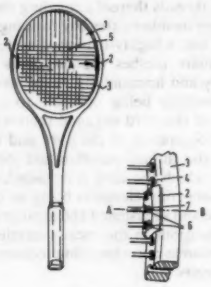
Herbert Glaessgen, Ulm-Wiblingen, and Wolfgang Kleinheinz, Lindau, both of Fed. Rep. of Germany, assignors to Dunlop Limited a British Company, United Kingdom

Filed Jun. 24, 1985, Ser. No. 747,852

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1984, 8418807

Int. Cl.[4] A63B *49/04*

U.S. Cl. 273—73 C **4 Claims**



1. In a games racket having adjustable playing properties, said racket having a frame comprising a head for stringing and a handle; said frame having at least one weight removably attached thereto at least one position on the circumference thereof,

the improvement which comprises at least one carrier member secured to said head at a position corresponding to the transverse axis extending through the center of percussion of said racket, each said carrier member having recesses to receive said weights; said frame including string-protecting grommets some of which are extended in length, said extended grommets having circumferential recesses to receive said carrier members.

4,693,475

RACKET HAVING ROTATABLY ADJUSTABLE HANDLE

Karl F. Keilhau, Tackheide 96/98, 4150 Krefeld, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 678,702, Dec. 6, 1984, abandoned. This application Sep. 10, 1985, Ser. No. 774,854

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1983, 3344329

Int. Cl.[4] A63B *49/08*

U.S. Cl. 273—73 J **7 Claims**

1. A racket for ball games, comprising a frame defining a racket head, a handle bar extending from said racket head, a hollow grip for attachment to a portion of said handle bar, said handle bar comprising a shank portion having one end attached to said racket head, a male conical section having one end attached to the end of said shank portion, and a cylindrical section having one end attached to the other end of said male conical section, said male conical section having a large diameter merging into said shank and a small diameter merging into said cylindrical section of said handle bar, said cylindrical section of said handle bar having first threaded means at its end opposite said conical section, and a connecting means further including as part of said hollow grip a female conical recess at a grip end facing said shank for receiving said male conical section of said handle bar, said hollow grip further comprising a cylindrical bore merging into said female conical recess and extending entirely through said hollow grip for receiving said cylindrical section of said handle bar, and second threaded means for cooperation with said first threaded means of said cylindrical section, said second threaded means having a flange bearing against a shoulder of said hollow grip for pulling said conical section into said conical recess to provide an exclusively frictional force locking rigid connection between said hollow grip and said handle bar in a rotational direction about a longitudinal central axis of said handle bar when said first and second threaded means are tightened to each other, said coni-

cal section and said conical recess are axially short relative to the length of said hollow grip and wherein said large diameter is slightly larger than said small diameter to provide a conicity which on the one hand assures said exclusively frictional force locking rigid connection while on the other hand being sufficiently slight and short enough for permitting a continuous stepless rotational adjustment of said racket head relative to said hollow grip into any relative angular position between said racket head and said hollow grip when said first and second threaded means are loosened for releasing said frictional force locking.

4,693,476

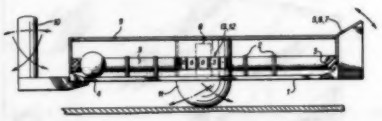
BALL-AND-TARGET GAME WITH TILTABLE PLAYING SURFACE THEREFOR

Rudolph Talamantez, Sr., 9 Oldham Rd., Silver Spring, Md. 20901

Continuation of Ser. No. 596,849, Apr. 4, 1984, abandoned. This application Jun. 5, 1986, Ser. No. 873,097

Int. Cl.[4] A63F *7/00*

U.S. Cl. 273—110 **5 Claims**



1. A ball-and-target game of skill with pinball machine and video electronic visual display features, said game comprising a tiltable planar upper playing surface and target means disposed thereon, said playing surface also having a pinball member disposed thereon for rolling contact against said target means, said playing surface further having a curved undersurface at which it may be tilted against any surface in contact therewith, and handle means extending from said playing surface for a player to apply a force to tilt said playing surface out of a horizontal plane in any desired direction and thereby

direct a pinball member to strike said target means in accordance with his or her skill to obtain a desired score, said game further comprising program means electronically connected with said target means, said target means also comprising a plurality of keys operating in response to being struck by said pinball member to provide inputs to said program means to perform selected mathematical operations including addition, subtraction, division, multiplication, square rooting of an assigned numerical value, and correction by erasing the entire score, said program means also being electronically connected to said target means and said video electronic visual display features to provide a cumulative score as various ones of said keys are caused to be struck by the pinball member.

4,693,477

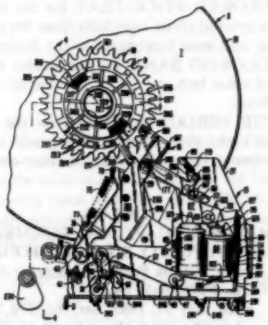
AMUSEMENT MACHINE

Peter D. Dickinson, 520 S. Rock Blvd., Reno, Nev. 89502, and Robert A. Luciano, 14430 Red Rock Rd., Reno, Nev. 89506

Division of Ser. No. 664,185, Oct. 24, 1984, Pat. No. 4,635,937. This application Aug. 11, 1986, Ser. No. 895,552

Int. Cl.[4] A63F *5/04*

U.S. Cl. 273—143 R **11 Claims**



1. A module for use with an amusement machine having a corresponding reel rotatably mounted therein, said module comprising:

a base plate;

linkage means for coupling a pawl arm to said base plate while guiding said pawl arm through a three-phase movement relative to said base plate, said three-phase movement comprising:

a first phase in which an engaging end of said pawl arm travels from a reel set position to a reel spin position spaced apart from said reel set position;

a second phase in which said engaging end travels from said reel spin position to a cocked position spaced apart from both said reel set and reel spin positions; and

a third phase in which said engaging end travels from said cocked position to said reel set position:

said linkage means comprising:

spring biasing means for biasing said pawl arm toward said reel spin position when said pawl arm is in said reel set position, and for biasing said pawl arm toward said reel set position when said pawl arm is in said cocked position;

at least one trip lever means pivotally mounted to said base plate for locking said pawl arm in said cocked position after said second phase movement is completed, and in said reel set position after said third-phase movement is completed, said at least one trip lever means being pivotable to a release position for releasing said pawl arm from said cocked position and said reel set position; and

cam follower means coupled to said pawl arm for moving said pawl arm from said reel spin position to said cocked position, against the resistance of said spring biasing means, when external force is applied to said cam follower means;

said module further comprising solenoid means cooperating with said trip lever means for pivoting said trip lever means to said release position upon receipt of a predetermined electrical signal

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4,693,478

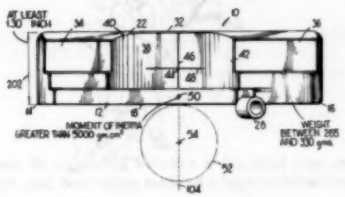
GOLF PUTTER HEAD

Dabbs C. Long, Albany, Ga., assignor to MacGregor Golf Company, Albany, Ga.

Filed Mar. 17, 1986, Ser. No. 840,250

Int. Cl.[4] A63B *53/04*

U.S. Cl. 273—164 **6 Claims**



1. A golf putter head which weighs between 265 and 330 grams and has a center of mass comprising:

(a) a blade a striking face, a blade sole, a heel end, a toe end, and a rear face wherein the blade has a width, a height greater than the radius of a standard golf ball, and a length of 5.5 inches or greater;

(b) a hosel attached to the blade;

(c) a flange having a top surface and a flange sole and integrally extending rearwardly from the blade adjacent the blade sole wherein the blade sole and the flange sole form a putter sole and the flange has a length equal to the length of the blade and a width greater than the width of the blade and such that the combined width of the blade and flange is at least 1.30 inch and wherein the flange has a reduced thickness center portion to create a cavity behind the blade and increased thickness portions adjacent the heel and toe of the blade,

wherein the mass of the head is distributed to establish a locus for the center of mass approximately one half way along the length of the blade and along the height of the blade at a vertical distance from the sole which when the putter head is raised for putting above a putting surface the center of mass is aligned vertically with a center of a standard golf ball resting on the putting surface and to establish a rotational moment of inertia about the center of mass greater than 5000 gm. cm.^{2}.

4,693,479

GOLF CLUB SWING TRAINING DEVICE

Robert P. McGwire, 150 W. Drake St., Apt. H4, Pomona, Calif. 91767

Continuation-in-part of Ser. No. 678,967, Dec. 6, 1984, abandoned. This application Apr. 24, 1986, Ser. No. 858,570

Int. Cl.[4] A63B *69/36*

U.S. Cl. 273—186 A **6 Claims**

1. A self-contained detachable device for selective attachment to a golf club to provide a visual indication of the position of the golf club during the backswing, forward swing and follow through portions of a golf swing wherein said visual indication is provided by visual reference to the golf ball being struck and the surface surrounding the golf ball, said golf club including a shaft having a longitudinal axis and a club head, said shaft having a grip portion with an end, said grip portion end having a circumference, said device comprising:

a cylindrical housing having a longitudinal axis, a top end and a bottom end;

means for securely mounting said cylindrical housing to said end of said grip portion of said shaft and for aligning said cylindrical housing coaxially with the longitudinal axis of said shaft;

light bulb means associated with said cylindrical housing top end for providing a directed beam of light extending outward from said housing in a direction along the longitudinal axis of said cylindrical housing and shaft when said housing is mounted thereon, said light bulb means being capable of providing a well-defined spot of light on the surface surrounding said golf ball during said golf swing;

battery means located within said cylindrical housing for providing electric current to said light bulb means; and

switch means associated with said cylindrical housing for providing a selective electrical connection between said battery means and said light bulb means to thereby selectively provide said light beam, wherein said light beam provides said visual indication of the position of said golf club during the golf swing by visual reference to the position of said spot of light relative to the golf ball being struck and the surface surrounding the golf ball when said device is mounted to said grip end.

4,693,480

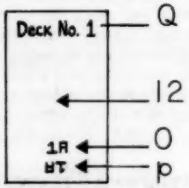
COLOR-CODED CARD GAME

Randolph Smith, 682 Pryor St., SW., Atlanta, Ga. 30315-1042

Filed Jun. 18, 1985, Ser. No. 746,130

Int. Cl.[4] A63F *1/00*

U.S. Cl. 273—296 **1 Claim**



1. A color-coded card game that contains two decks of cards with five kinds of card game accessories to make it easy for the dealer to control the game by instructing the players according to the color(s) and the symbol on each card, and therefore the game comprises:

DECK NUMBER ONE which contains each matching card that has either one or two colors to match the other matching cards found only in deck number one,

DECK NUMBER TWO which contains each instruction card that has one symbol (ball means to buy 2 cards, star means to sell 2 cards, triangle means to trade 2 cards, wall means to win 2 cards, and octagon means to owe 2 cards) and one background (meaning the player who is the color of the symbol must buy, sell, trade, win, or owe 2 cards from/to the player who is the color of the said background) and contains each winning card that has ten colors, each color on a small separate square except for the single color on a big separate square below the said small squares when one of the players who is one of the different colors on the 9 small squares can win all of the colored coins from the first and/or second bank if the said one player has cards that equal 3 whole matching colors the same color of the big separate square on the winning card,

THE COLORED COINS when each said coin, after being dropped into the colored bank, will be won by the player(s) and rarely by the dealer(s) and each one of the said coins can be handed to the dealer while each color of a coin refers to a certain player who is the same color of the coin,

THE ID (identification) TAGS to identify each player and the dealer because each ID tag is a certain color so each player can be a certain color (red player, blue player, etc.),

THE PLAYERS' ASSEMBLE CARD to show the players how to be seated around the dealer and how to find the next player to buy, sell, trade, win, or owe 2 cards from/to when there is at least one missing player,

THE COLORED STICK-TRAY for the dealer to use to receive colored coins, especially from the players who are faraway and must hand coins to the dealer,

THE COLORED BANK for the dealer to use to drop colored coins into and/or for the players to win colored coins from,

AND THE SERIAL NUMBERS on the cards and the colored coins to prevent cheating and discourage any player from trying to cheat in the color-coded card game.

4,693,481

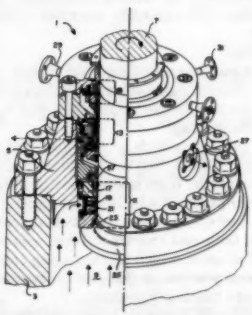
FILM-RIDING SHAFT SEAL FORMED FROM HIGH-PURITY SILICON NITRIDE

Kenneth P. Quinn, Allison Park, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 31, 1985, Ser. No. 739,745

Int. Cl.[4] F16J *15/20*; C04B *35/58*

U.S. Cl. 277—96.2 **13 Claims**



1. A sealing assembly for maintaining a pressure boundary in a heated and pressurized fluid that contains abrasive particles while transmitting mechanical energy across said pressure boundary, comprising a sealing ring and a seal runner, each of which includes a substantially flat face for forming a sealing surface, and each of which is substantially formed from silicon nitride, wherein said sealing surfaces are relatively movable with respect to one another, are biased toward one another by a compressive force of up to 90,000 pounds and radially tapered with respect to one another in order to direct said fluid at said pressure boundary into a film of flowing fluid between said surfaces upon which said relatively movable sealing surfaces ride, and wherein said silicon nitride that forms said

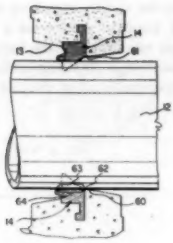
sealing ring and ring runner is hot pressed and at least 98% pure in order to render said ring and runner resistant to both abrasion from said particles and to thermal shock, and further to render said sealing ring and runner operative in a non-film riding mode for at least 30 minutes without significant wear.

4,693,482

MOLDED ELASTOMERIC CIRCULAR GASKET

Clement Daigle, Saint-Jean Chrysostome, and Emile Gonthier, St.-Henri, Cte Levis, both of Canada, assignors to Les Industries Fortier Ltee, Canada

Filed Sep. 19, 1985, Ser. No. 777,613
Int. Cl.[4] F16J *15/32*
U.S. Cl. 277—207 A **4 Claims**



1. A molded elastomeric circular gasket for resiliently supporting a sewer pipe in a manhole opening and sealing the space between the wall of the opening and the surface of the pipe, the transverse cross-section of said gasket having:

(a) a generally triangular head, having a forward face provided with an arcuate depression therein, and a sloping rear face;

(b) a generally rectangular body, integral with said generally triangular head; and

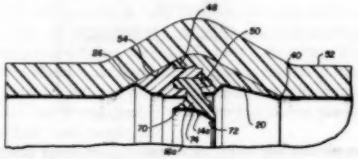
(c) a generally "L" shaped leg depending from said body, and coextensive with the rear face of said body.

4,693,483

COMPOSITE GASKET AND FITTING INCLUDING SAME

Jose E. Valls, Ponce, P.R., assignor to Vassallo Research & Development Corporation, Ponce, P.R.

Continuation-in-part of Ser. No. 630,527, Jul. 13, 1984, Pat. No. 4,637,618. This application Jan. 18, 1985, Ser. No. 692,700
The portion of the term of this patent subsequent to Jan. 20, 2004, has been disclaimed.
Int. Cl.[4] F16J *15/32*
U.S. Cl. 277—207 A **16 Claims**



1. A composite gasket for forming a seal between a pipe bell and a spigot, comprising:

a major portion of non-elastomeric plastic material; and

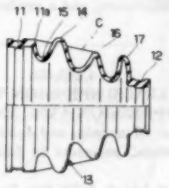
a minor portion of elastomeric material, said minor portion being axially encased by said major portion and having a first sealing lip extending from said major portion in a radial direction, said major portion including first and second segments entrapping said minor portion therebetween, said segments having interlocking sections, said sealing lip being triangular in transverse cross section and tapering in a radial direction toward said major portion.

4,693,484

BOOT FOR UNIVERSAL JOINT

Mikio Ukai, Nagoya, and Ryouji Okumoto, Nakashima, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Continuation of Ser. No. 712,849, Mar. 18, 1985, abandoned. This application Apr. 7, 1986, Ser. No. 848,919
Claims priority, application Japan, Mar. 24, 1984, 59-56534
Int. Cl.[4] F16J *3/04, 15/52*
U.S. Cl. 277—212 FB **3 Claims**



1. A boot for extending between a universal joint and an output shaft, said boot being made of a high-molecular elastomer:

(a) wherein said boot is in the form of a bellows having at least three ridges extending between a larger ring portion fixed to the universal joint and a smaller ring portion fitted to an output shaft, and wherein a valley is formed between the first ridge of said bellows and said larger ring portion, wherein the external diameter of said valley is smaller than the internal diameter of said larger ring portion, and wherein the distance between the crests of the first and second ridges is so short as to bring them into mutual contact during angular deflections of the output shaft; and

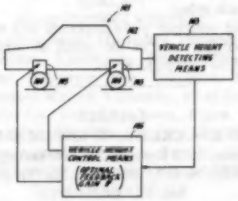
(b) wherein the crest of said first ridge has its inner circumference located outside of the imaginary circumference of the frustum of a cone formed by joining the outer periphery of said larger ring portion at the side to be connected to said bellows and the crest of said second ridge.

4,693,485

VEHICLE HEIGHT CONTROL APPARATUS

Eiichi Kamei, Nagoya; Hideaki Namba, Oobu, and Masahiro Ohba, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 4, 1986, Ser. No. 826,012
Claims priority, application Japan, Feb. 4, 1985, 60-20673
Int. Cl.[4] B60G *17/00*
U.S. Cl. 280—6 R **8 Claims**



1. A vehicle height control apparatus, comprising:

(a) a plurality of vehicle height adjusting members for controlling the height of a vehicle at front and rear positions of said vehicle in accordance with various control signals;

(b) vehicle height detecting means for producing vehicle

height detection signals by detecting the height of said vehicle at front and rear positions of said vehicle;

(c) first means for obtaining differences between predetermined target adjustment values and vehicle heights respectively represented by said vehicle height detection signals from said vehicle height detecting means; and

(d) second means for obtaining a state variable by estimating an internal state of each of said vehicle height adjusting members, on the basis of said control signals and said respective vehicle height detection signals, which internal state varies momentarily after the application of said control signal; and

for producing said respective control signals for the momental vehicle height adjustment on the basis of said state variable, an integrated value obtained by integrating said differences, and a predetermined optimal feedback gain.

4,693,486

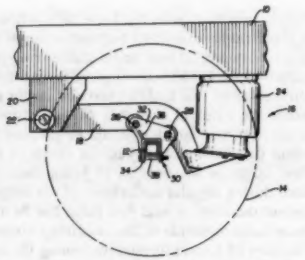
TRAILING ARM SUSPENSION WITH WRAPPER COMPRESSION AXLE MOUNTING

William C. Pierce, Muskegon, and John P. Smith, Grand Rapids, both of Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Apr. 9, 1986, Ser. No. 849,762

Int. Cl.[4] B60B *35/00*

U.S. Cl. 280—80 R **18 Claims**



1. A vehicle suspension system for mounting ground-engaging wheels to a vehicle frame, the suspension system comprising at least two substantially rigid arms secured to opposite sides of the frame through substantially aligned pivot mounts; at least one wheel-carrying axle mounted to said arms; and an axle support means securing said at least one axle to each of said arms; the improvement in each of said axle support means comprising:

a wrapper plate having an elongated planar complementary surface wrapping at least 180° around said axle and depending opposite sides extending beyond said axle;

compressing means for diametrically compressing said axle by drawing said opposite sides of said wrapper plate toward each other;

whereby said wrapper plate supports and strengthens said wheel carrying axle at the point at which said axle is connected to said rigid arms.

4,693,487

STEERING KNUCKLE AND SPINDLE ASSEMBLY

Randy G. Cooper, 7405 Refugee Rd., Pickerington, Ohio 43147

Filed Nov. 1, 1985, Ser. No. 794,074

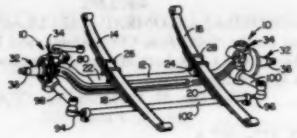
Int. Cl.[4] B62D *7/18*

U.S. Cl. 280—96.1 **12 Claims**

1. In a non-powered, rigid beam, steering axle pivotally attached to a unitary spindle means having an integral steering knuckle which is attached to said axle by a king pin, the improvement for facilely adjusting the camber angle of said spindle means which comprises:

said spindle means being formed in two sections, a spindle section having a stub shaft adapted to mount a wheel and having a lateral support surface which is non-perpendicular to the axis of said stub shaft;

a steering knuckle section which is adapted to receive said king pin and which has a lateral support surface which conformingly engages said spindle support surface; and



attaching means for rigidly attaching said spindle section to said steering knuckle section at a plurality of discrete locations, said attaching means being removable so that said spindle section is rotatable with respect to said steering knuckle section to adjust the camber angle of said stub shaft.

4,693,488

ELECTRICALLY CONTROLLED MOTORCYCLE STAND

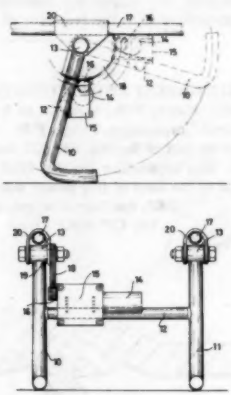
Giovanni Bernocco, Cherasco, Italy, assignor to TEMSIR S.r.l., Cherasco, Italy

Filed Sep. 11, 1985, Ser. No. 775,121

Claims priority, application Italy, Sep. 17, 1984, 67929 A/84

Int. Cl.[4] B62H *1/02*

U.S. Cl. 280—293 **1 Claim**



1. An electrically controlled motorcycle stand comprising: an electric motor having a shaft; a switch which operates said motor; a pinion connected to said shaft and rotatable by said motor and which meshes with and is rotatable on a sector gear; and a hinge through which the stand is connected to a motorcycle, wherein said sector gear is secured to the frame of the motorcycle and has a center which coincides with the hinge such that through the action of the motor and the pinion and the sector gear and the hinge, the stand is made to rotate between two positions which are the lowered operative and the raised rest positions of the stand respectively.

4,693,489

HEELPIECE FOR SAFETY SKI BINDING

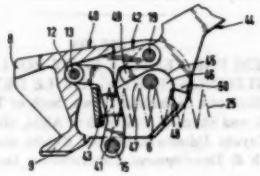
Premek Stepanek, Garmisch-Partenkirchen; Ludwig Wagner, Farchant, and Walter Knabel, Murnau, all of Fed. Rep. of Germany, assignors to Marker International Company, Salt Lake City, Utah

Filed Feb. 20, 1985, Ser. No. 703,270

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1983, 3322634

Int. Cl.[4] A63C *9/08*

U.S. Cl. 280—634 7 Claims



1. A heelpiece for a safety ski binding, said heelpiece comprising:

a base for attachment to a ski;

a support member mounted on said base;

a soleholder mounted on said support member for pivotal movement about a first axis transverse to said support member between closed and open positions for holding and releasing a ski boot, respectively, said soleholder having a forwardly extending ski boot engaging member and including a rearward facing flange surface on the rear end thereof;

a bearing lever mounted on said support member for pivotal movement about a second axis, said second axis being fixedly located near said base and parallel to said first axis;

opening lever means having a surface in operative engagement with the flange surface of said soleholder for movement therealong to effect arcuate movement of said opening lever means about an imaginary third axis, said third axis being parallel to and offset from said first axis;

connecting means connected to said opening lever means and to said bearing lever, said connecting means being attached to said opening lever means for rotation about a fourth axis parallel to said first, second and third axes;

said soleholder having first cam means and said bearing lever having second cam means, said first cam means having a first portion, a second portion and a critical portion between said first and second portions, and said second cam means being engageable with the respective portions of said first cam means; and,

adjustable spring means for biasing said second cam means against said first cam means;

said second cam means engaging the first portion of said first cam means and said spring means biasing said soleholder to the closed position when said second cam means proceeds from said critical portion towards said first portion, and said second cam means engaging the second portion of said first cam means and said spring means biasing said soleholder to the open position when said second cam means proceeds from said critical portion towards said second portion.

4,693,490

COLLAPSIBLE WHEEL-CHAIR

Jan A. T. Loodberg, Nyhamnsläge, and Olle L. Siwersson, Helsingborg, both of Sweden, assignors to AB Scaniainventor, Helsingborg, Sweden

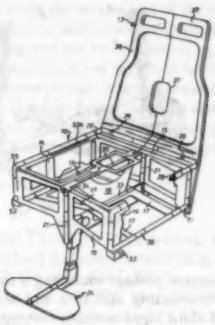
PCT No. PCT/SE86/00023, § 371 Date Oct. 15, 1986, § 102(e) Date Oct. 15, 1986, PCT Pub. No. WO86/04230, PCT Pub. Date Jul. 31, 1986

PCT Filed Jan. 23, 1986, Ser. No. 923,149

Claims priority, application Sweden, Jan. 24, 1985, 8500317

Int. Cl.[4] B62B *11/00*

U.S. Cl. 280—650 15 Claims



1. A collapsible wheel-chair having a foldable frame structure (10) which can be locked in the unfolded state and which supports the wheels (11, 12) and the back (13) of the wheel-chair and which comprises a box-shaped seat having side wall members (14) connected to foldable seat and bottom members (15, 16; 17) and to foldable front and rear wall members (19; 20), characterized in that the seat and bottom members (15, 16; 17) are foldable upwards and each consist each of two rigid, hingedly interconnected seat and bottom portions, respectively, (15, 16; 17) and are mechanically interconnected for common folding movements, that the front and rear wall members (19; 20) are foldable rearwards and each consist of two rigid, hingedly interconnected front and rear wall portions, respectively, (19; 20) and are mechanically interconnected by means of a rigid member (22) extending underneath the bottom portion (17), and that the back (13) can be raised and consists of two back portions (26, 27) which are pivotally connected to the rear edge of a respective part (15) of the foldable seat member (15, 16) and which in the unfolded state of the wheel-chair extend downwards behind the rear wall member (20) for releasably engaging a locking device (37) provided on the frame structure.

4,693,491

SUSPENSION SYSTEM

Yousuke Akatsu, Yokohama; Hirotsugu Yamaguchi, Chigasaki; Naoto Fukushima, Kamakura; Sunao Hano, Yokosuka; Masaru Sugino, Fujisawa; Shin Takehara, Higashi Hiroshima, and Shinichi Matsui, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 21, 1986, Ser. No. 820,369

Claims priority, application Japan, Jan. 22, 1985, 60-10633; Feb. 5, 1985, 60-15156[U]; May 20, 1985, 60-75530[U]

Int. Cl.[4] B60G *13/00*

U.S. Cl. 280—688 45 Claims

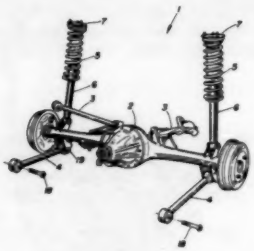
1. A suspension system of a vehicle, comprising:

a first member supported by a vehicle body of said vehicle;

a second member supported by a wheel support structure of said vehicle;

an elongate structure interposed between said first and second members to connect them, said structure including:

a first rigid member connected to said first member,
a second rigid member connected to said second member,
a first elastomeric member secured to said first rigid member and defining a first fluid chamber which is variable in volume,
a second elastomeric member secured to said second rigid member and defining a second fluid chamber which is variable in volume,
means defining a fluid communication passage through which said first and second fluid chambers are fluidly connected with each other, said means defining a fluid



communication passage including a third rigid member securely connecting said first and second rigid members, said third rigid member having a constant axial length so that the distance between said first and second elastomeric members is substantially constant,
a fluid filling said first and second fluid chambers and said fluid communication passage, and
means for forming a fluid dynamic damper with said fluid and said first and second elastomeric members, said fluid dynamic damper having a resonance frequency approximately coincident with a resonance frequency of a vibration system including said elongate structure.

4,693,492

WHEEL SUSPENSION USING AN ARC SPRING

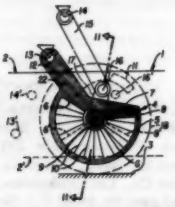
Manfred Schindler, Markt Schwaben, and Walter Vilsmeier, Grosshelfendorf, both of Fed. Rep. of Germany, assignors to FICHT GmbH, Kirchseeon, Fed. Rep. of Germany

Filed Apr. 1, 1986, Ser. No. 846,687

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1985, 3512051

Int. Cl.[4] B60G *11/28*; F16F *9/04*

U.S. Cl. 280—705 **14 Claims**



1. A hydropneumatic suspension for a vehicle having a chassis comprising:
(a) a housing being in cross-section a sector of a circle, bearing a shaft at the origin of a circular portion and having fitted therein a circular-arc suspension member and an abutment member pivotally mounted about said shaft;
(b) first and second pivot points mounted upon said chassis;
(c) a suspension arm integral with or securely attached to said housing and pivotally mounted upon said chassis at said first pivot point;
(d) a hinging lever having an inner end securely connected to said abutment member;
(e) a control arm pivotally mounted upon said chassis at said second pivot point and pivotally connected to the outer end of said hinging lever by a hinge joint;
(f) a gas spring; and
(g) means for hydraulically connecting said gas spring to said circular-arc suspension member;
wherein, when the suspension is in the extended position, said suspension arm and said control arm are essentially parallel and the hinge joint pivotally connecting said control arm and said hinging lever is located on the side of an imaginary line connecting said second pivot point and said shaft in said housing which is away from said suspension arm.

4,693,493

SYSTEM FOR VEHICLE BODY ROLL CONTROL UTILIZING STEERING ANGLE DETECTION

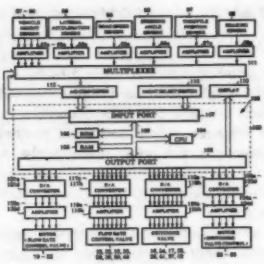
Hiroyuki Ikemoto; Nobutaka Oowa, both of Toyota; Yasutaka Hayashi, and Shunichi Doi, both of Aichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Toyota Central Research & Development Laboratories, Inc., both of Aichi, Japan

Filed Oct. 21, 1986, Ser. No. 921,251

Claims priority, application Japan, Oct. 22, 1985, 60-235659; Oct. 22, 1985, 60-235660; Oct. 22, 1985, 60-235661

Int. Cl.[4] B60G *11/26*

U.S. Cl. 280—707 **31 Claims**



1. For a vehicle comprising a body and a plurality of wheels upon which it runs, a vehicle roll control system of vehicle height adjustment type, comprising:
a plurality of actuator assemblies, one provided corresponding to each one of said vehicle wheels and resiliently suspending said one of said vehicle wheels from the vehicle body, said actuator assemblies comprising pressure chambers and each being adapted to increase or decrease vehicle height at a location corresponding to its corresponding vehicle wheel as respective results of supplying or discharging of working fluid to or from its said pressure chamber;
a plurality of working fluid supplying and discharing means which are provided corresponding to said actuator assemblies and which serve to supply working fluid to said working fluid chambers and to discharge working fluid from said working fluid chambers;
a vehicle speed detecting means for sensing the road speed of the vehicle;
a steering angle detecting means for sensing the steering angle of the vehicle; and:
a means for computing and control, which computes a steady state roll angle ϕ_∞ of the vehicle body from the vehicle speed sensed by said vehicle speed detecting means and the steering angle sensed by said steering angle detecting means, and computes a difference value ϕ based

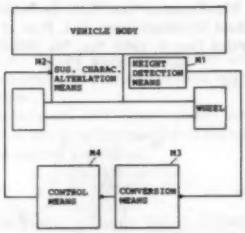
thereon, said computing control means being adapted to control said working fluid supplying and discharging means according to said difference value ϕ when the absolute value of said difference value ϕ is larger than a determined value.

4,693,494

SUSPENSION CONTROLLER

Shuuichi Buma, Toyota; Toshio Onuma, Susono; Kaoru Ohashi, Okazaki, and Masami Itou, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 1, 1986, Ser. No. 914,736
Claims priority, application Japan, Oct. 1, 1985, 60-219687
Int. Cl.[4] B60G *9/00*
U.S. Cl. 280—707 **10 Claims**



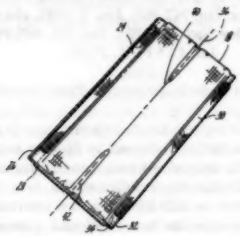
1. A suspension controller of a vehicle comprising:
vehicle height detection means for detecting a vehicle height at a front wheel and for generating a vehicle height signal according to the distance;
conversion means for converting the vehicle height signal into a corresponding converted height signal, wherein the converted height signal increases more sharply than the vehicle height signal when the vehicle height signal is greater than a preset value and decreases sharply when the vehicle height signal is less than another preset value;
control means for generating a suspension characteristic alteration signal depending on the converted height signal; and
suspension characteristic alteration means for altering characteristics of suspensioning of the vehicle in response to the suspension characteristic alteration signal.

4,693,495

SHOULDER BELT CUSHION

Virginia L. LaPointe, 21825 Superior, Taylor, Mich. 48180

Filed Jan. 13, 1986, Ser. No. 817,979
Int. Cl.[4] B60R *22/00*
U.S. Cl. 280—808 **3 Claims**



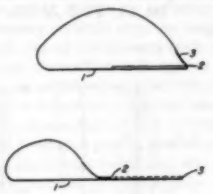
1. A cushion for a shoulder belt, comprising:
and elongated resilient pad;
a flexible cover enclosing the pad so that a portion of said cover extends laterally outwardly from each side of said pad, the cover having a pair of spaced parallel side edges;
the pad and the cover having a longitudinal fold line disposed parallel to the side edges and between the side edges, said fold line being equidistantly spaced from said side edges, the fold line having a first end adjacent one end of the pad, and a second end adjacent the opposite end of the pad;
releasable fastener means connected to the outwardly extending portion along the pair of spaced side edges;
first stitching along one end of the fold line having a length substantially less than the length of the fold line;
second stitching along the second end of the fold line having a length such that the midsection of the fold line, between the first stitching and the second stitching, is unstitched;
whereby the pad and the cover may be folded along the fold line and the opposite side edges releasably fastened together about a shoulder belt so as to be slidable along the shoulder belt to a position in which the unstitched midsection of the fold line is disposed adjacent a user in a selected position along the shoulder belt.

4,693,496

ELASTOMERIC COATING REMOVAL PROCESS

Fred L. Leonetti; Richard L. Leonetti, and Frank A. Leonetti, all of P.O. Box 6622, Concord, Calif. 94524

Continuation of Ser. No. 843,870, Mar. 25, 1986, Pat. No. 4,627,643, which is a continuation-in-part of Ser. No. 803,002, Nov. 29, 1985, abandoned. This application Aug. 7, 1986, Ser. No. 894,169
The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.
Int. Cl.[4] B42D *15/00*
U.S. Cl. 283—102 **4 Claims**



1. In a card whose surface contains printed information concealed by a removable opaque coating, the improvement comprising a pitted region on said card for abrading said removable opaque coating to expose said printed information, and a perforated line separating said pitted region from the remainder of said card to facilitate detachment thereof.

4,693,497

COLLET CONNECTOR

Ronald G. Pettus, Houston, and Thomas R. Schmitz, Katy, both of Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

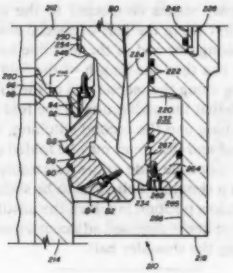
Filed Jun. 19, 1986, Ser. No. 876,086
Int. Cl.[4] F16L *25/00*
U.S. Cl. 285—12 **8 Claims**

1. A remotely actuated connector for connecting a first and second tubular member together comprising
a plurality of latching fingers,
an actuator ring surrounding said fingers,
pressure responsive means for moving said actuator ring,
means for selectively delivering fluid pressure to opposite sides of said pressure responsive means to move said actuating ring,
each of said latching fingers having an engaging projection at one end and a locating means at the other end with both

of said projecting facing inwardly and means for securing an adapter to said other end, and

a plurality of adapters,

one of said adapters being connected to said other end of each one of said latching fingers on said projection and secured thereto by said securing means,



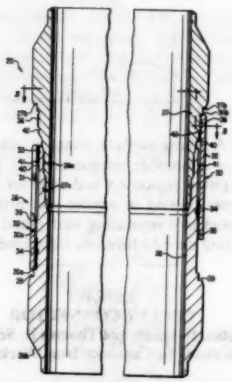
said adapters each providing at least one of a first projection and a second replaceable projection on said inner ends of said latching fingers which engage and secure the end profiles of adjacent tubular members together.

4,693,498

ANTI-ROTATION TUBULAR CONNECTION FOR FLOWLINES OR THE LIKE

Benton F. Baugh, Houston, and Narayana N. Panicker, Dallas, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 28, 1986, Ser. No. 856,308
Int. Cl.[4] F16L *21/08*
U.S. Cl. 285—39 **5 Claims**



1. An anti-rotational, tubular joint for connecting sections of conduits together, said joint comprising:

a pin member having male threads thereon adapted to be affixed to an end of a section of conduit;

a box member having female threads thereon adapted to be affixed to an end of another section of conduit, said female threads cooperate with said male threads to form a connection therebetween when said pin member is rotated in a first direction with respect to said box member;

a lock sleeve slidably positioned on said box member and movable longitudinally thereon between a unlocked position and a locked position when said pin member is threaded in said box member; said sleeve having longitudinal grooves extending along an upper portion thereof thereby defining a plurality of resilient fingers;

ratchet teeth on each of said plurality of said fingers; and

ratchet teeth on said pin member adapted to cooperate with said ratchet teeth on said fingers when said sleeve is in said locked position to allow rotational movement between said lock sleeve and said pin member in a first direction while preventing rotational movement between said lock sleeve and said pin member in an opposite direction; and

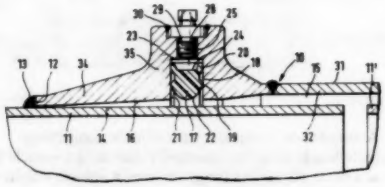
means on said lock sleeve and said box member for allowing longitudinal movement while preventing rotational movement therebetween.

4,693,499

PIPELINE FOR GASEOUS FLUIDS AND METHOD OF ASSEMBLING ITS COMPONENTS

Klaus Servè, Radevormwald, Fed. Rep. of Germany, assignor to Manibs. R. Mannesmann GmbH. & ibs Nagel GmbH. & Co. KG, Remscheid-Bliedinghausen, Fed. Rep. of Germany

Filed Dec. 5, 1985, Ser. No. 805,957
Int. Cl.[4] F16L *13/02*
U.S. Cl. 285—96 **20 Claims**



4. In a pipeline, particularly for compressed gaseous fluids, the combination of a first tubular member including a first end portion having an external surface; a second tubular member including a second end portion having an internal surface surrounding said external surface, a free end, and a ring-shaped groove extending radially outwardly from said internal surface, said groove having axially spaced apart side walls; means for bonding said free end to said first end portion; a deformable ring between the side walls of said groove; and means for deforming said ring radially inwardly into sealing engagement with the external surface of said first end portion and axially into sealing engagement with said side walls independently of the fluid in the pipeline so as to allow for the application of said bonding means, particularly an annular weld, while the pressure in said tubular members deviates from the pressure of the surrounding atmosphere.

4,693,500

SWIVEL JOINT

David Anderson, P.O. Box 550, Sand Springs, Okla. 74063

Continuation of Ser. No. 742,405, Jun. 7, 1985, abandoned. This application Sep. 17, 1986, Ser. No. 908,965
Int. Cl.[4] F16L *27/08*
U.S. Cl. 285—94 **4 Claims**

1. A swivel joint for connecting two fluids carrying conduits comprising:

an inner conduit section for connecting to a first conduit;

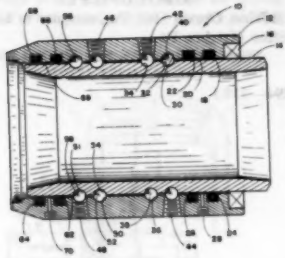
an outer conduit section adapted to fit over said inner conduit section for connecting to a second conduit, said outer conduit section having an inner end;

said outer conduit section having a first internal circumferential groove near its inner end and a second internal circumferential groove spaced from said first groove;

a first O-ring seal in said first internal circumferential groove;

a second O-ring seal within said second internal circumferential groove;

a pressure chamber in the annulus between said inner conduit section and said outer conduit section between said first internal circumferential groove and said second internal circumferential groove;



a grease confined in said pressure chamber under pressure without dependency on pressure of fluid within said inner conduit section;

bearing means between said inner conduit and said outer conduit section at a location exterior of the space between said first and second O-ring.

4,693,501

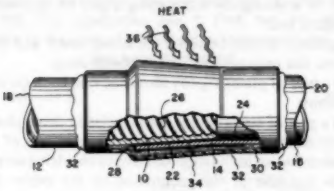
REFRIGERATION TUBING JOINT

Terance B. Logsdon, Jr., Whitehouse, and Donald L. Fisher, Tyler, both of Tex., assignors to American Standard Inc., New York, N.Y.

Filed Jul. 23, 1986, Ser. No. 888,593

Int. Cl.[4] F16L *13/00, 58/09*

U.S. Cl. 285—173 **6 Claims**



1. A tube assembly comprising a first tube made mostly of copper that is bonded to an outer surface of a second tube made mostly of aluminum to form a joint said second tube having a roughened inner surface and said joint having an outer surface that is covered by a heat shrinkable tube having a thermosetting adhesive inner coating whose adherence to said joint is initiated by heating said shrinkable tube, said shrinkable tube being impermeable to moisture and thus inhibiting galvanic corrosion around said joint.

4,693,502

PIPE CONNECTION

Hans Oetiker, Oberdorfstrasse 21, 8810 Horgen, Switzerland

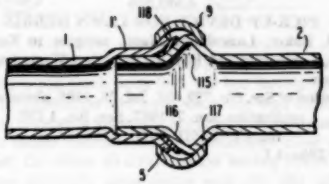
Division of Ser. No. 815,371, Jul. 13, 1977, which is a continuation-in-part of Ser. No. 531,793, Dec. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 387,446, Aug. 10, 1973, abandoned. This application May 7, 1986, Ser. No. 860,422

Claims priority, application Switzerland, Aug. 10, 1972, 11836/72

Int. Cl.[4] F16L *25/00*

U.S. Cl. 285—334.5 **26 Claims**

1. A pipe connection between a first and a second part, of which at least one part is a tubing means having an axis provided with an inclined wall portion formed by a flared lip extending at an angle to its axis, and of which the other part having an axis and including means near one end thereof providing at least one wall portion inclined at an angle to its axis which is at least approximately similar to said first angle, a short externally cylindrically shaped means internally bridging the connection and extending into said first-mentioned tubing means, and clamping ring means having an annular portion operable to be tightened by contraction in the radially inward direction, said clamping ring means having a ring axis and internal flanks at least partially defining an approximately U-shaped profile at its internal surface thereof in a cross-sectional plane containing the axis of said clamping ring means and substantially parallel thereof, the internal flanks of said clamping ring means being at least approximately complementary to and operable in the contracted condition of the ring means to engage with the inclined wall portions of said first



and second part, so that, in the contracted condition of the clamping ring means, the inclined wall portions and therewith the first and second part are urged toward each other, and at least one substantially plastically deformbale lug-shaped ear means in the annular portion of the clamping ring means, said ear means being capable of plastic deformation to thereby tighten the clamping ring means by reducing its diametric dimension and to thereby securely urge the inclined wall portions of said first and second part toward each other to establish a permanent pipe connection safe against unintentional opening and capable of withstanding relatively high pressures and vibrations as well as temperature fluctuations which can be opened again only by destruction of the clamping ring means or its ear means, said U-shaped profile extending over at least the circumference of the annular portion of said clamping ring means, and said short externally cylindrically shaped means being constituted by said second part.

4,693,503

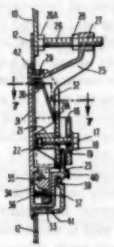
LEVER LATCH

Robert H. Bisbing, Springfield, Pa., assignor to Southco, Inc., Concordville, Pa.

Filed Mar. 6, 1986, Ser. No. 837,095

Int. Cl.[4] E05C *3/08*

U.S. Cl. 292—210 **12 Claims**



1. A combination latch and handle device comprising a housing, a handle pivotally attached to said housing, a latch

having a button component and a keeper-engagable nose component, said latch being pivotally mounted on said handle and having its button component forming an extension thereof, a keeper on said housing adapted to receive said latch when said handle is moved to its closed position, and a mounting bracket engaging said housing;

said device further characterized by biasing means mounted on said housing and constructed and arranged to contact and restrain said latch in its latched position; said device further comprising a first additional biasing means engaging said housing and said handle whereby the handle and the latch are urged to the open position when the latch is disengaged from the keeper, and a second additional biasing means engaging said handle and said latch whereby the latch is urged to a position in which its handle-extended outer surface is contiguous with the outer surface of said handle.

4,693,504

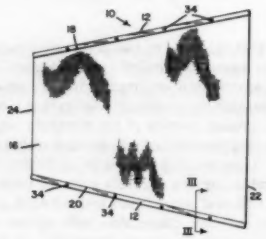
PICK-UP DEVICE FOR LAWN DEBRIS

Anna M. Baker, Lunenburg, Mass., assignor to Kenneth R. Baker, Lunenburg and Paul G. Derosier, Westminster, both of, Mass.

Continuation of Ser. No. 759,405, Jul. 26, 1985, abandoned. This application Jan. 7, 1987, Ser. No. 1,170

Int. Cl.[4] B65D *75/00*; **B65F** *1/12*

U.S. Cl. 294—1.1 **4 Claims**



1. A pick-up and carrier device for particulate material, comprising:

(a) a first elongated rigid bar having a first end and a second end,

(b) a second elongated rigid bar having a first end and a second end, and

(c) a sheet of planar flexible material having a first side edge which is attached to said first bar, a second side edge which is attached to said second bar, a first end edge which extends between the first ends of said first and second bars, and a second end edge which extends between the second ends of said first and second bars, said second end edge being substantially shorter than said first end edge so that when said sheet is fully extended and said first and second bars and said sheet lie in the same plane, said first and second bars taper toward each other from said first ends to said second ends at an angle of between 7° and 17° to define a trapezoid, so that when said bars are brought together to enclose a quantity of particulate material, said device assumes a frusto-conical shape having an open large diameter end and an open small diameter end, whereby said device is utilized for picking up a quantity of particulate material by placing said device in the fully extended state on a quantity of particulate material and bringing said rigid bars toward each other to enclose said material, whereby said device is utilized for carrying said particulate material by holding said device so that said small diameter end is down while continuing to urge said rigid bars toward each other and, whereby said device is utilized for disposing of said paritculate material by holding said device over a disposal site so that said small diameter end is down and moving said bars away from each other to allow said particulate material to funnel down to said disposal site.

4,693,505

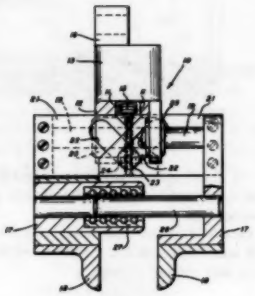
ROBOT GRIPPER

Frank N. DiMeo, Drexel Hill, Pa., assignor to Litton Systems, Inc., Clifton Heights, Pa.

Filed Apr. 14, 1986, Ser. No. 851,468

Int. Cl.[4] B25J *15/02*

U.S. Cl. 294—119.1 **7 Claims**



1. A gripper mechanism having opposed parallel fingers which open and close while remaining parallel to one another, the gripper mechanism comprising:

a body member;

a bidirectional rotary motor mounted on the body member;

a drive screw coupled to said rotary motor for rotation therewith;

a pair of arms rigidly supporting a pair of opposed parallel fingers; and

engagement means between the drive screw and the pair of arms, the engagement means comprising:

(a) a pair of plates rigidly mounted one each on the pair of arms;

(b) a pair of straight elongated inclined drive slots formed on each in the pair of plates, wherein one of the drive slots has an inclination relative to the drive screw which is opposite to the inclination of the other drive slot relative to the drive screw;

(c) a roller element engaging each of the drive slots and coupled to the drive screw, whereby rotation of the drive screw causes the roller element to be displaced along the length of the drive screw, and the engagement of the roller element with the inclined drive slots translates the displacement of the roller element along the drive screw into lateral motion of the plates and the pair of arms and fingers, whereby rotation of the screw in one direction causes the arms and the fingers to open, and rotation of the screw in the opposite direction causes the arms and fingers to close.

4,693,506

COMBINATION AIR FAIRING AND AUXILIARY AIR BRAKING DEVICE

Arnold R. Massengill, Rte. 2, Box 194A, New Tazewell, Tenn. 37825

Filed May 6, 1986, Ser. No. 860,078

Int. Cl.[4] B62D *35/00*

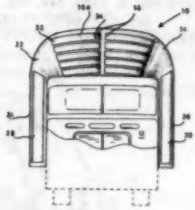
U.S. Cl. 296—1 S **20 Claims**

1. A combination air fairing and auxiliary air braking device for use in connection with trucks, vans, trailers or like vehicles having a cab and an upstanding surface to the rear of said cab extending above said cab, said device comprising:

an air fairing structure positioned upon the top of said cab

which serves to produce a preselected outline and reduce aerodynamic drag upon said upstanding surface resulting from air resistance to movement of said vehicle, said air fairing structure provided with a plurality of openings in a frontal portion thereof, said openings positioned between a front edge and a rear edge of said air fairing structure;

a plurality of relief doors carried by said air fairing structure,



each relief door associated with one of said openings for selectable operation between closed and opened positions such said drag is reduced when said relief doors are closed and said drag is increased when said relief doors are opened due to impingement of air flow upon said upstanding surface; and

means for selectively and rapidly opening and closing said relief doors.

4,693,507

TRUCK CARGO BED LINER WITH ANTI-SLIP SURFACE

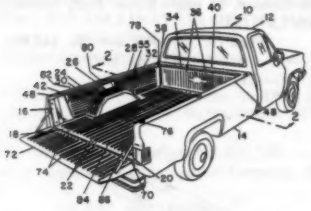
William L. Dresen, Baraboo; William F. Price, Portage; Phillip L. Emery, Portage; Harlan W. Breezer, Portage, and Robert R. Holmes, Portage, all of Wis., assignors to Penda Corporation, Portage, Wis.

Continuation-in-part of Ser. No. 608,341, May 8, 1984, Pat. No. 4,592,583. This application Jun. 2, 1986, Ser. No. 869,425

The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.

Int. Cl.[4] B62D *33/02*

U.S. Cl. 296—39 R **10 Claims**



1. A protective truck cargo bed liner of unitary vacuum formed plastic adapted to fit within and protect the contours of a truck cargo bed having a floor, two side walls, a front wall, two rear wheel wells, and a rear access opening, comprising:

a. a liner bottom wall adapted to fit on the truck cargo bed floor;

b. two liner wheel wells formed in the liner bottom wall at opposite sides thereof and adapted to accommodate the truck cargo bed rear wheel wells;

c. a liner front wall connected to and extending upwardly from the liner bottom wall;

d. two liner side walls connected to the liner bottom wall and wheel wells and the liner front wall at opposite sides thereof, each liner side wall projecting upwardly from the liner bottom wall and adjacent wheel well; and

e. a selected elastomeric material having an effectively high co-efficient of friction co-formed with and integrally adhered to the upper surface of the plastic forming the liner to provide an anti-slip film thereon for restraining movement of cargo on the liner.

4,693,508

TRACK ASSEMBLIES FOR MOUNTING COVERS AND CANOPIES ON PICKUP TRUCK BEDS

Dorothy E. Pettit, 18219 46th Pl. South, Seattle, Wash. 98188

Filed Sep. 26, 1986, Ser. No. 912,056

Int. Cl.[4] B60P *7/00*

U.S. Cl. 296—100 **24 Claims**

1. For use in combination with a pickup truck having a cab and an open top truck body bed, the bed having upstanding, opposed, longitudinal side walls, each side wall terminating in an upper, elongated generally horizontal surface and a cover structure means dimensioned to substantially close the truck body bed, the cover structure means having lower opposed side edges generally coterminous with the side wall upper surfaces; the improvement comprising track means for slidably interengaging the side wall upper surfaces with the cover opposed side edges comprising: first elongate male track means rigidly associated with one of the truck bed side wall upper surfaces or the cover opposed side edges; second, elongate female track means rigidly associated with the other of the truck bed side wall upper surfaces or the cover opposed side edges, said male and female track means being slidably interfitted with one another whereby the cover structure means may be slid on and off the track body bed; means defining a first, generally horizontal, flat face on said male track means; means defining a second, generally horizontal flat face on an interior portion of said female track means which, with the female and male rail means in assembly, slidably engage one another as the cover structure means is slid onto and off the truck body bed; and elongate channel means formed in at least that flat face means of the elongate track means associated with truck body bed side wall upper surfaces whereby otherwise conventional headed fasteners may be employed to secure the rail means to the side wall upper surfaces, the channel means being dimensioned so that the heads of the headed fasteners are entirely received within the channel means whereby any interference fit between the sliding, cooperating male and female track means is prevented.

4,693,509

CONVERTIBLE TOP

Howard Moy, Rochester; James R. Thomas, Sterling Heights, and Donald J. Droske, Mt. Clemens, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 28, 1986, Ser. No. 845,260

Int. Cl.[4] B60J *1/18, 7/12*

U.S. Cl. 296—201 **18 Claims**

1. An arrangement for supporting a convertible top nonflexible back window in a raised position in a vehicle body comprising in combination:

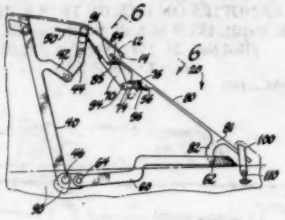
means for pivotally attaching said window to said body;

means for angularly biasing said window away from said body;

an upper window link pivotally attached to said window opposite said body;

a support link pivotally attached to said upper window link, said support link also having a surface in contact with said window whereby most of said window and said pivotal

attachment of said window with said upper window link are on the same side of a line intersecting said surface of said support link in contact with said window and said pivotal attachment of said support link with said upper window link; and

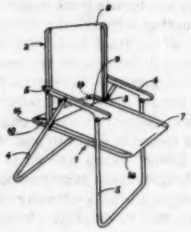


tensioning means independent of said angular biasing means operatively connecting said support link with a portion of said vehicle top forward of said window.

4,693,510
FOLDING CHAIR

Sisto Marchesini, Montecchio Maggiore Vicenza, Italy, assignor to ICU Intercommerz Union S.A., Riva San Vitale, Switzerland

Continuation of Ser. No. 594,668, Mar. 28, 1984, abandoned. This application Oct. 14, 1986, Ser. No. 918,688
Claims priority, application Italy, Mar. 28, 1983, 21298/83[U]
Int. Cl.[4] A47C *4/30, 4/44*
U.S. Cl. 297—39 **10 Claims**



1. In a folding chair including a first metal frame defining the seat and a second metal frame defining the backrest, said frames being hinged together and to supporting legs to permit the opening and closing of the chair, and seat and backrest portions of fabric or the like having outer ends connected to ends of the aforesaid frames, wherein the improvement comprises a transverse retaining element positioned rearwardly of said seat and having ends received in said seat frame, said seat and backrest fabric portions each having inner ends connected together at a common junction intermediate the outer ends thereof, and a unitary elongated elastic strip having a width substantially equal to the width of the seat and backrest fabric and extending across said fabric portions adjacent said common junction and having a first end secured directly to said seat fabric portion and a second end secured directly to said backrest fabric portion, said strip passing over a portion of the surface of and around said transverse retaining element and being under tension between said first and second ends thereof to keep the seat and backrest fabric portions taut to define substantially planar seat and backrest portions when the chair is unfolded to an open position, said strip positioned to extend at an obtuse angle with the planes of each of said seat and backrest fabric portions when the chair is unfolded to an open position to maintain each of the seat and backrest fabric portions in a taut condition.

4,693,511
AUTO SEAT COVER

Samuel M. Seltzer; Saul Dennison, both of Livingston, and Frank Dolan, Sr., Essex Fells, all of N.J., assignors to Allison Corporation, Livingston, N.J.

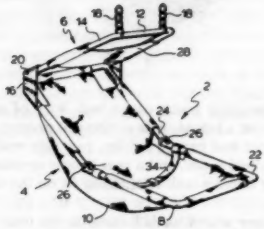
Filed Sep. 8, 1986, Ser. No. 904,417
Int. Cl.[4] A47C *27/00*
U.S. Cl. 297—219 **10 Claims**

1. A one piece auto seat cover comprising an open mouthed tubular back cover terminating in a lower free edge, the back cover enveloping the back rest of an auto seat, and a seat portion intergrally joined to said back cover at an interconnected common junction for fitting onto the seat cushion of the auto seat, strap means extending from the common junction of the back cover with the seat portion for feeding through a crevice of the auto seat between its back rest and its seat cushion, and loop means depending from the lower free edge of the back cover for securing to said strap means thereby snugly retaining the seat cover in place on the auto seat with the free edge of the back portion pulled down over the rear of the back rest.

4,693,512
SWING SEATING UNIT

J. David Hobson, 34 Eagle Street East, Newmarket, Ontario, Canada L3Y 1J1

Filed Oct. 3, 1986, Ser. No. 915,052
Int. Cl.[4] A47D *13/10*
U.S. Cl. 297—277 **19 Claims**



1. A collapsible swing seating unit comprising a seating section and a suspension section, said seating section including a generally elongate frame arrangement having a sunken seating portion therewithin,

said suspension section being connected to one end of said frame arrangement and being adapted to in one position be upwardly angled such that a free end thereof is above the mid point of the frame arrangement,

said suspension section being movable relative to said frame

arrangement to a collapsed storage position, and means for suspending said seating unit from said suspension section adjacent the free end thereof,

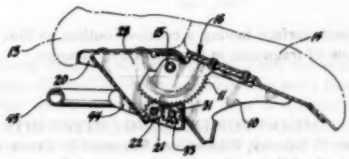
said suspension section cooperating with said frame adjacent said one end to provide the sole structural connections therebetween, said structural connections being limited to said one end, leaving the remaining area intermediate said suspension section and said frame clear of obstruction.

4,693,513

THIGH SUPPORT FOR VEHICLE SEAT

Peter W. Heath, Billericay, England, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 27, 1987, Ser. No. 6,775
Int. Cl.[4] A47C *3/00*
U.S. Cl. 297—284 **8 Claims**



1. A vehicle seat adjustable thigh support pivotal joint, said joint in combination comprising:

a first link providing a first support;

a second link pivotally attached with said first link providing a second support;

a first gear fixably attached to said first link;

a second gear meshed with said first gear and rotatively attached to said second link; and

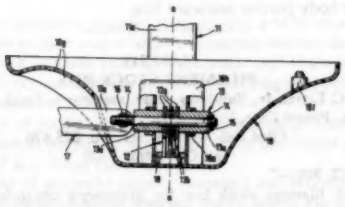
a third gear rotatively attached to a lever, said lever being attached to one of said links whereby said third gear has a first selective position meshed with said first and second gears to lock the position of said thigh support and said third gear having a second selective position meshed with not more than one of said first and second gears to allow adjustment of said thigh support.

4,693,514

CHAIR HAVING A CLAMPING DEVICE FOR ADJUSTING THE INCLINATION OF THE BACK AND/OR SEAT

Rolf Völkle, Siemensstrasse 2, D-7298 Lossburg, Fed. Rep. of Germany

PCT No. PCT/DE85/00235, § 371 Date Mar. 10, 1986, § 102(e) Date Mar. 10, 1986, PCT Pub. No. WO86/00508, PCT Pub. Date Jan. 30, 1986
PCT Filed Jul. 8, 1985, Ser. No. 857,749
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1984, 3425387
Int. Cl.[4] A47C *1/024*
U.S. Cl. 297—374 **12 Claims**



1. Chair, particularly a roatable office chair, having a foot rest which includes a central supporting spindle, seat means (**10, 23**) carried by the support spindle and having vertical ribs (**10c;10c';10c''**) formed to define support bearings (**10a;10a'**) which are located at least approximately symmetrically to the plane of symmetry of the chair, a back rest carried by the seat means, and a clamping device supported in the bearings and connected to at least one of the seat means and back rest for adjusting the inclination of at least one of the seat means and back rest by laminar friction,

said clamping device being composed of: a packet (**12,12'**) of laminae (**12a;12a'**) which are provided with elongated holes and are articulated to at least one of the seat means and back rest; a friction lock disc packet (**13;13'**) of annular, coaxial friction lock discs (**13a;13b;13a';13b'**) having friction locking faces which lie against the laminae (**12a;12a'**); a clamping bolt (**14;14'**) which passes through the laminae and discs; and a manually actuable lever operatively associated with the clamping bolt for effecting relative displacement between the clamp bolt and the laminae and discs in order to control the clamping of the laminae between the discs; characterized in that;

said friction lock discs are movably mounted in said support bearings, so that said clamping device is movable in the direction of the axis of said clamping bolt;

the plane of symmetry of the chair passes throgh said packet of laminae and said friction lock disc packet; and

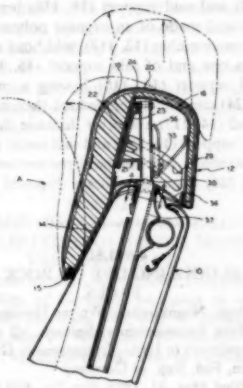
said lever constitutes a self-inhibiting eccentric having a pivot axis fixed to said clamping bolt and bears against one end of said friction lock disc packet such that pivotal movement of said lever about its pivot axis causes axial displacement of said clamping bolt and causes the parts of said packet of laminae and friction lock disc packet which are respectively opposite sides of the plane of symmetry of the chair to move in respectively opposite directions.

4,693,515

HEADREST FOR AN AUTOMOTIVE VEHICLE SEAT

Vincent Russo, Cary, N.C., and Max O. Heesch, Brooklyn, Mich., assignors to ITT Corporation, New York, N.Y.

Filed Oct. 27, 1986, Ser. No. 923,335
Int. Cl.[4] A47C *1/10*
U.S. Cl. 297—391 **14 Claims**



1. A headrest for an automotive vehicle seatback comprising:

first frame means having a generally hollow interior defining a headrest configuration;

second frame means in said hollow interior of said first frame means including means for mounting said second frame means to said seatback;

first track means connecting said first frame means to said second frame means providing for movement of said first frame means relative to said second frame means over a first path of movement defined by said first track means in a generally forward and a generally rearward direction relative to said seatback between a fully rearward position and a fully forward position; and

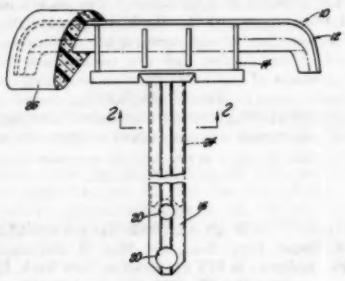
expansible-contractable means mounted between said first frame means and said second frame means for selectively causing said first frame means to move to any of an infinite number of intermediate positions between said fully rearward position and said fully forward position said first frame means being movable in said forward direction upon expansion of said expansible-contractable means and in said rearward direction upon contraction of said expansible-contractable means.

4,693,516

HEADREST ASSEMBLY AND METHOD FOR MAKING SAME

Hillery G. Knecht, 1720 Tiverton, Bloomfield Hills, Mich. 48013

Filed Aug. 14, 1986, Ser. No. 896,430
Int. Cl.[4] A47C *7/36*
U.S. Cl. 297—391 **1 Claim**



1. A protective headrest (10, 110) for mounting on the seat back of an automotive vehicle comprising; a frame member (12, 112) including a head (14, 117) and a support (16, 116), said head (14, 117) and said support (16, 116) being integral and homogeneous and made of an organic polymeric material to define said frame member (12, 112), said head extending transversely across one end of said support (16, 116) to define a T-shape, said support (16, 116) having a preformed metal support bar (24) completely embedded therein and extending from said head (14, 117) a shorter distance than said support (16, 116), said support (16, 116) and said metal support bar (24) having a substantially rectangular cross-section, and a protective covering (26) comprising foam disposed over said head (14, 117).

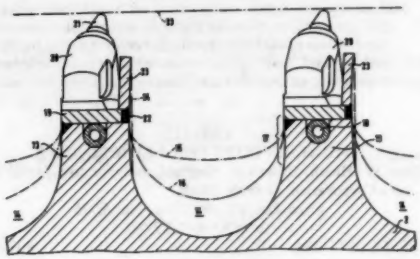
4,693,517

CUTTER FOR GOUGING ORE OR ROCK FROM MINE FACES

Martin Eisenbeis, Neunkirchen; Walter Hemmer, Wiebelskirchen, and Hans Krummenauer, Spiesen, all of Fed. Rep. of Germany, assignors to Hans Krummenauer GmbH & Co. KG, Neunkirchen, Fed. Rep. of Germany

Filed Mar. 11, 1986, Ser. No. 838,527
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1985, 3508881
Int. Cl.[4] E21B *10/00*
U.S. Cl. 299—87 **8 Claims**

1. A cutter for gouging out ore or rock, comprising a hollow rotary support arranged to penetrate into a mine face or the like and comprising a wall with helical external threads and helical grooves alternating with said threads and being devoid of dead corners wherein the fragments could accumulate and stagnate; and a plurality of bits provided on said threads to remove frgments from the ore or rock into which the bits penetrate in response to rotation of the support whereby the removed fragments enter into and flow in the grooves in the axial direction of the support, said support having bottom surfaces which bound said grooves and at least a portion of



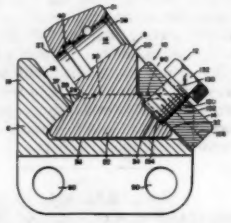
each such surface having a concave outline to thus promote the flow of fragments in the respective grooves.

4,693,518

MEANS FOR HOLDING CUTTER BITS

William P. Sulosky, Winber, and Raymond D. Evans, Jr., Everett, both of Pa., assignors to Kennametal, Inc., Latrobe, Pa.

Continuation of Ser. No. 223,257, Jan. 8, 1981, abandoned, which is a continuation-in-part of Ser. No. 141,775, Apr. 21, 1980, abandoned. This application Nov. 14, 1986, Ser. No. 931,922
Int. Cl.[4] F21C *25/12, 35/18*
U.S. Cl. 299—93 **48 Claims**



1. A cutter bit support block adapted to be driven in a forward direction comprising: a lower body portion having a forward face slanting rearwardly upward and a rear abutment face slanting forwardly upward, said lower body portion being a polyhedron approximating the outline of a truncated right triangular prism whose largest base forms the bottom face of said lower body portion; an upper body portion having downward facing longitudinal shoulders ending at the juncture of said upper and lower body portions; and a perforation for receiving the shank of a cutter bit, said perforation communicating between an upper body portion forward face and an upper body portion rearward face.

4,693,519

FILAMENT STOCK BOX

John C. Lewis, Jr., Salisbury, Utah, assignor to Tucel Industries Inc., Forest Dale, Vt.

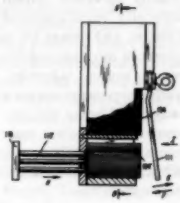
Filed Feb. 4, 1986, Ser. No. 825,870
Int. Cl.[4] A46D *1/08*
U.S. Cl. 300—7 **15 Claims**

1. A filament stock box for dispensing cut-to-length filaments in predetermined tufts comprising:

a box, including front, back and side walls and a base, the lower portion of said front wall having at least one aperture therethrough having a predetermined configuration;

vibrating means coupled to said back wall for causing at least

the lower portion thereof to vibrate toward and away from said front wall whereby filaments are contained within said box oriented parallel to the planes containing the and side walls, and said back wall vibrates against the adjacent ends thereof while a tuft thereof is withdrawn through the aperture;



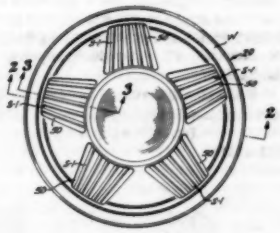
choke means disposed within said box above the aperture defining a filament picking zone therebelow and a filament reservoir above for regulating the flow of filament from the reservoir into the picking zone whereby the density of filament in the picking zone will be less than the density in the reservoir.

4,693,520

AUTOMOTIVE VEHICLE WHEEL WITH NON-SUPPORTING SPOKES

Raymond C. Brown, Tarzana, Calif., assignor to Superior Industries International, Inc., Van Nuys, Calif.

Filed Feb. 21, 1986, Ser. No. 831,503
Int. Cl.[4] B60B 7/04
U.S. Cl. 301—37 SS **19 Claims**



1. In an automotive vehicle wheel having a body that includes a hub portion and a radially extending bolt-on flange portion which extends radially outwardly and rearwardly from the hub portion to merge into a tire-receiving rim portion, the combination of;

a plurality of pockets formed in the bolt-on flange portion, said pockets projecting rearwardly from the frontal surfaces of said flange portion;

a single set of generally radially extending and rearwardly straight spoke elements disposed solely within the front portion of some or all of said pockets; and

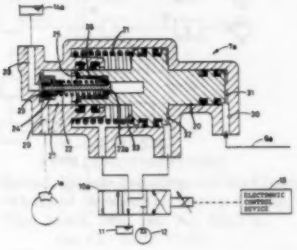
attachment means securing the radially outer end of each of said spoke elements to said rim portion and the radially inner end of said spoke elements to said hub portion.

4,693,521

AUTOMOBILE BRAKING FORCE CONTROL APPARATUS

Koji Takata, and Yukinori Nishiyama, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 22, 1985, Ser. No. 801,139
Claims priority, application Japan, Dec. 12, 1984, 59-261969
Int. Cl.[4] B60T 8/00
U.S. Cl. 303—103 **8 Claims**



1. An automobile braking force control apparatus for controlling the braking forces applied to any one of a number of wheel brakes individually and in groups, comprising an operator operable means such as, a brake pedal (2) for providing a first brake operating force, a master cylinder (3) connected to said brake pedal for converting said first brake operating force from said brake pedal (2) into a first hydraulic pressure, actuator means including actuator pistons for operating a respective wheel brake of said wheel brakes, operating channels (6*a*, 6*b*, 6*c*, 6*d*) leading from said master cylinder to said wheel brakes for supplying said first hydraulic pressure to said actuator pistons, an auxiliary pressure source for supplying a second auxiliary hydraulic pressure, auxiliary power circuits connecting said auxiliary pressure source to said actuator pistons of actuator means, control valves disposed in said auxiliary power circuits and controlled by an electronic control device, for limiting said second, auxiliary pressure to suitable pressure magnitudes which are effective on said actuator pistons in combination with the first hydraulic pressure from said master cylinder (3) in both positive and negative directions for said braking force control.

4,693,522

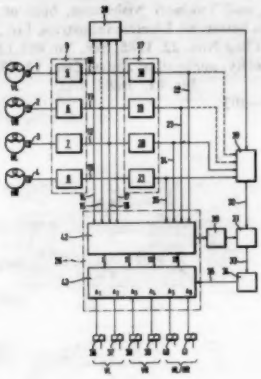
PROCESS AND CIRCUIT ARRANGEMENT FOR ADAPTING SLIP CONTROL TO THE MOMENTARY FRICTION VALUE

Hans Wupper, Friedrichsdorf, and Gunther Buschmann, Idstein, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 13, 1986, Ser. No. 818,614
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1985, 3500745
Int. Cl.[4] B60T 8/70
U.S. Cl. 303—105 **6 Claims**

1. A circuit arrangement for adapting slip control of an anti-skid brake system of an automotive vehicle to the momentary friction value between a road surface and the vehicle tires comprising, sensors for the detection of the rotational behavior of the wheels, circuits for the handling and differentiation of the sensor signals as well as for the generation of braking pressure control signals by means of which electromagnetically operable multi-directional valves in the pressure medium paths of the brake system are controllable, and including circuits (28, 29) for the identification of the velocity (v_R) and of the deceleration (v_R) of the momentarily fastest wheel and a

friction coefficient identification circuit (31) by means of which, upon the instabilization of a wheel, the braking pressure



control signals are variable as a function of the deceleration (v_R) of the momentarily fastest wheel.

4,693,523

SLIP CONTROLLED BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES

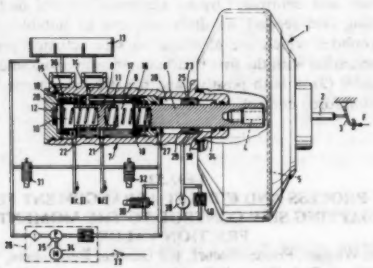
Helmut Steffes, Eschborn, Fed. Rep. of Germany, assignor to ITT Corporation, New York, N.Y.

Continuation of Ser. No. 665,749, Oct. 29, 1984, abandoned. This application Dec. 9, 1986, Ser. No. 939,233

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1983, 3342908

Int. Cl.[4] B60T *8/44*

U.S. Cl. 303—114 **4 Claims**



1. A slip-controlled brake system for an automotive vehicle having vehicle wheels, said system comprising, in combination:

a pedal-operated brake booster;

a tandem master cylinder connected to said brake booster by a push-rod of a push-rod piston operating adjacent a first pressure chamber in said tandem master cylinder and said tandem master cylinder having an intermediate piston coupled to said push-rod piston and operating adjacent a second pressure chamber in said tandem master cylinder;

first and second hydraulic brake circuits respectively connected between said first and second chambers and said vehicle wheels;

an annular chamber surrounding said push-rod piston in said master cylinder;

said push-rod piston including radial expansion means intermediate its extremities thereby limiting movement of said push-rod piston within said chamber;

an auxiliary pressure source connected to said annular chamber in said master cylinder;

means for activating said auxiliary pressure source during slip control;

a resetting sleeve means mounted on said push-rod piston and sealably axially moveable within said annular chamber in a substantially unencumbered fashion relative to said push-rod piston, and means for increasing and directing auxiliary pressure into said annular chamber from said auxiliary pressure source whereby said sleeve means contacts said radial expansion means and moves said push-rod piston toward said brake booster;

an ambient pressure compensation reservoir;

a plurality of sensors respectively coupled to said vehicle for providing electrical signals indicative of the rotational behavior of said wheels;

means coupled to said sensors for providing output signals indicative of said rotational behavior;

a first valve connected in a fluid line extending between said auxiliary pressure source and said reservoir, said first valve being normally open to permit free passage of said increased auxiliary pressure from said auxiliary pressure source directly to said reservoir in the absence of output from said sensors, but, said first valve being responsive to said output signals to close during slip control;

a second valve connected in a fluid line extending between said reservoir and said first chamber, said second valve being normally closed and being responsive to said output signals to open during slip control after closure of said first valve, said first valve providing direct access of said auxiliary pressure to reset the push-rod and to further provide dynamic control for slip control by means of

a third valve connected in a fluid line extending between said auxiliary pressure source and said first chamber, said third valve being normally closed and being responsive to said output signals to open after said second valve reverts to its normally closed state;

whereby, said output signals and said three valves dynamically control said first hydraulic brake circuit during slip control and overide the static braking effect of said booster.

4,693,524

COMPONENT ELEMENTS FOR BUILDING FURNITURE

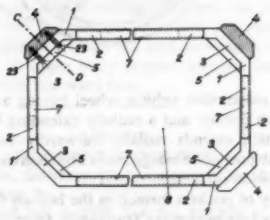
Vicente N. Navarro, Pl. Eduardo Marquina, 18-26°, 46014, Valencia, Spain

Filed Dec. 27, 1984, Ser. No. 686,746

Claims priority, application Spain, Dec. 27, 1983, 276.569

Int. Cl.[4] A47B *47/00*

U.S. Cl. 312—140 **11 Claims**



1. Component elements for building furniture comprising:

a vertical column having a plurality of column orifices adapted to receive a fastening member;

a horizontal support member connected to said vertical column, said horizontal support member including:

a support body portion,

a plurality of body orifices disposed in said support body portion and positioned to align with said column orifices,

support end portion means projecting from said support body portion,

a rib means projecting from said horizontal support member in a direction generally perpendicular to said vertical column;

wherein said horizontal support member has first and second support body portions adapted to be connected to first and second vertical columns, respectively, said first and second support body portions being spaced at an angle relative to each other and connected to each other by a common support end, both of said body portions having a plurality of said body orifices defined therein.

4,693,525

CASING FOR ELECTRONIC APPARATUS

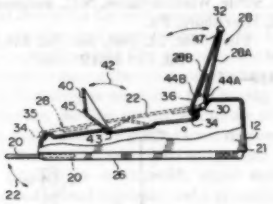
Yoshinori Shinoto, Tokyo, Japan, assignor to Linguatron Limited, Hamilton, Bermuda

Filed Feb. 21, 1986, Ser. No. 831,986

Claims priority, application Japan, May 28, 1985, 60-114659

Int. Cl.[4] A47B *81/00*

U.S. Cl. 312—208 **5 Claims**



1. A casing (**12**) for an electronic apparatus comprising a box-like casing body (**21**) and a lid (**28**);

said casing body (**21**) including an upper surface having an open portion (**22**) therein, a front portion positioned forwardly of said open portion, a rear portion positioned rearwardly of said open portion and a pivot portion (**30**) proximate to said rear portion,

said lied (**28**) including a first rectangular platelike member (**28A**) having first front and rear edges, said first rear edge being attached pivotally to said pivot portion (**30**) and a second rectangular platelike merber (**38B**) having second front and rear edges, said second rear edge being attached pivotally to said first front edge of said first platelike member, said platelike members being dimensioned to cover said open portion when said lid is extended to a generally planar closed position and to expose said open portion when said lid is folded to an open position,

a first fixing means (**34, 35**) for causing the second front edge of said second platelike member to be fixed to said front portion of the casing body in said closed position,

a second fixing means (**34, 36**) for causing the second front edge of said second platelike member to be fixed to said rear portion of the casing body in said open position,

said first fixing means (**34, 35**) comprising a protrusion merber (**34**) integrally formed on the second front edge of the second platelike member and a first convex portion (**35**) integrally formed on the front portion of the casing body such that said protrusion member (**34**) may engage said first convex portion (**35**), whereby said lid (**28**) may be firmly positioned in the closed position so as to cover said open portion (**22**) by extending said two platelike members (**28A, 28B**),

and said second fixing means (**34, 36**) comprising said protrusion merber (**34**) and a second convex portion (**36**) integrally formed on the rear portion of the casing body such that said protrusion member (**34**) may engage said second convex portion (**36**), wherein said lid (**28**) may be firmly positioned in the open position so as to expose said open portion (**22**) by folding said two platelike members (**28A, 28B**), said first front edge of the first platelike members (**28A**) being positioned rearwardly of said pivot portion (**30**) and said second front edge of the second platelike members (**28B**) being positioned forwardly of said pivot portion (**30**) when said lid is positioned in said open position.

4,693,526

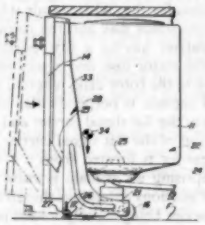
APPLIANCE SUPPORT

Raymond W. Spiegel, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 4, 1982, Ser. No. 336,770

Int. Cl.[4] A47B *91/00*

U.S. Cl. 312—250 **2 Claims**



1. In an appliance having a housing defining a bottom portion including a front, a rearmost, and an intermediate portion, and an operating mechanism having a portion projecting downwardly from said housing bottom intermediate portion to define a bottom portion of the mechanism, improved means for adjustably supporting the appliance for facilitated rearward movement of the appliance with the front being raised, said means comprising:

downwardly extending vertically adjustable levelers mounted one each to opposite sides of said housing bottom front portion;

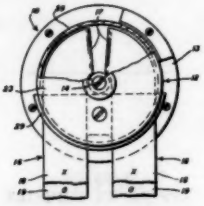
a pair of rollers mounted one each to opposite sides of said housing substantially forwardly of said housing rearmost portion more closely to the center vertical plane of the appliance than to said rearmost portion to be disposed laterally rearwardly and adjacent the downwardly projecting portion of the operating mechanism whereby said front portion of the housing may be readily lifted to permit rolling movement of the housing on said rollers free of engagement of said mechanism bottom portion with the surface on which the housing is being moved, said appliance defining a center of gravity acting downwardly a short distance forwardly of said rollers; and

a pair of side supports disposed one each at opposite sides of the housing, each of said side supports defining a front mounting portion and a rearward mounting portion, said levelers being mounted one each to the front mounting portions of the side supports, and said rollers being mounted one each to the rearward mounting portions of the side supports, said rearward support portion defining a plurality of mounting holes for selectively mounting the roller in different positions thereon.

4,693,527
ROLLING LOOP TWIST CAPSULE

Kenneth E. Bonenberger, Blacksburg, Va., assignor to Litton Systems, Inc., Blacksburg, Va.

Filed Apr. 28, 1986, Ser. No. 856,247
Int. Cl.[4] H01R 39/02
U.S. Cl. 439—13 **10 Claims**



1. A twist capsule for conducting signals between an input and an output which are rotatable relative to one another, the twist capsule comprising:

a stator disk;

a rotor disk which is spaced from the stator disk;

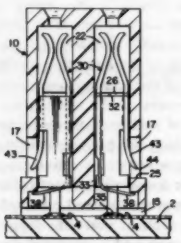
an axis of rotation for the twist capsule which is perpendicular to both the stator disk and the rotor disk; and

a flat signal carrier having a first portion which is fixed relative to the stator disk and a second portion which is fixed relative to the rotor disk, wherein the axis of rotation of the twist capsule is perpendicular to the plane of the first portion of the flat signal carrier and to the plane of the second portion of the flat signal carrier, and wherein said flat signal carrier is formed from a U-shaped flat signal carrier comprising an arcuate portion and two side-by-side straight portions extending therefrom, said U-shaped flat signal carrier being loosely folded in the region of the arcuate portion to form a rolling loop between said first portion and said second portion, the rolling loop allowing at least 350 degrees of rotation between the stator disk and the rotor disk.

4,693,528
SURFACE MOUNT CONNECTOR WITH FLOATING TERMINALS

John C. Asick, Harrisburg; George H. Douty, Mifflintown, and James S. Staron, Millersburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 740,111, May 31, 1985, abandoned. This application Jun. 6, 1986, Ser. No. 873,138
Int. Cl.[4] H01R 9/09
U.S. Cl. 439—83 **12 Claims**



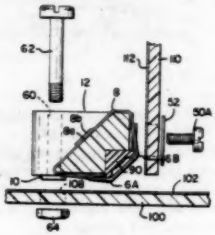
1. An electrical connector of the type for mounting onto a circuit board for electrical connection with conductive areas thereof comprising a dielectric housing having terminal-receiving passages extending therethrough and including retaining shoulders therein, electrical terminals respectively positioned within the terminal-receiving passages and having contact sections and conductor-engaging sections, and retaining members on the terminals for engagement with the retaining shoulders thereby retaining the terminals in position in the terminal-receiving passages, characterized in that said terminals are axially moveable along said passages between limiting positions defined by engagement of a pair of retaining members with respective retaining shoulders and

one of said retaining members springably engages one of the retaining shoulders when the connector is mounted on the circuit board thereby urging and maintaining the conductor-engaging sections in electrical engagement with respective conductive areas on the circuit board.

4,693,529
ELASTOMERIC MOTHER-DAUGHTER BOARD ELECTRICAL CONNECTOR

Donald G. Stillie, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 31, 1986, Ser. No. 846,325
Int. Cl.[4] H01R 9/09
U.S. Cl. 439—67 **15 Claims**



1. An electrical connector for interconnecting circuitry on a first substrate to corresponding circuitry on a perpendicularlly mounted second substrate, each substrate having conductive elements disposed on one surface thereof as part of the circuitry on the substrate, the connector comprising:

a body of cylindrical lengthwise configuration having a first mounting surface for mounting said first substrate thereto, and a second mounting surface perpendicular to said first mounting surface for mounting said second substrate thereto, said body further including a recess formed in the corner of the intersection of the first and second surfaces;

means for mounting the first substrate to the connector;

means for mounting the second substrate to the connector,

an elastomeric insert disposed in said recess, said insert having a first node extending beyond and normal to said first mounting surface, and a second node extending beyond and normal to said second mounting surface,

a flexible insulating film surrounding the elastomeric insert and at least a portion of the cylindrical body, said film having conductive traces disposed thereon,

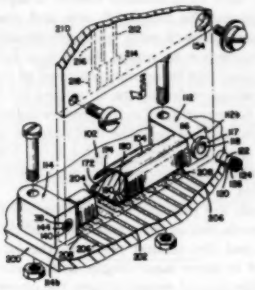
whereby, when the first substrate is mounted adjacent the first mounting surface and the second surface is moujted adjacent the second mounting surface, the first and second nodes are each resiliently deformed inwardly to a point planer with the respective first and second mounting surfaces, normally biasing the conductive traces on the film against the circuitry disposed on the substrates.

4,693,530

SHIELDED ELASTOMERIC ELECTRIC CONNECTOR

Donald G. Stillie, and Paul D. Zakary, both of Winston-Salem, N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 29, 1986, Ser. No. 912,707
Int. Cl.[4] H05K *1/00*
U.S. Cl. 439—67 20 Claims



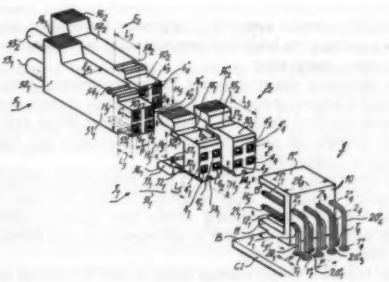
1. An electrical connector for interconnecting circuitry on a first substrate to circuitry on a second substrate, the connector comprising a body portion and a film assembly, the body portion including means to mount the substrates to the connector; the film assembly including an insulative film having an inside and an outside surface, the film having a plurality of conductive signal traces and at least one ground trace disposed on the outside surface of the the film, said signal and ground traces on said film being profiled to interconnect signal and ground traces of said first and second substrate, and a grounding means disposed on the inside surface of the film thereof, a first end of the film being placed against the body portion with the inside surface facing the body portion, the film being wrapped around the body portion until at least a portion of a second end of the film overlaps the first end, thereby commoning the grounding means with the grounding trace.

4,693,531

CONNECTING DEVICE FOR TESTING PRINTED CIRCUIT

Francis Raphal, and Jean-Paul Roy, both of 41, rue Cantagrel, 75624 Paris Cedex 13, France

Filed Oct. 12, 1984, Ser. No. 660,276
Claims priority, application France, Oct. 14, 1983, 83 16366
Int. Cl.[4] H01R *31/08*
U.S. Cl. 439—512 9 Claims



1. Apparatus for electrically testing a printed circuit board (CI), comprising

(a) a generally U-shaped base member (1) having a transverse portion (10) and a pair of parallel spaced leg portions (11, 11');

(b) at least one intermediate member (3_1, 3_2) removably mounted within the space defined between said leg portions, said intermediate member comprising a generally U-shaped block having a transverse portion (30_1, 30_2) and a pair of parallel spaced leg portions (32_1, 32_1'), said intermediate member being arranged with the same orientation as said base member and with its transverse portion adjacent the transverse portion of said base member;

(c) at lease one plug member (5_1, 5_2) arranged on the opposite side of said intermediate member from said base member;

(d) the transverse portion of said intermediate member containing a plurality of parallel through openings extending longitudinally in the direction between said base and plug members;

(e) a plurality of open-ended first female contacts (4_1, 4_1') mounted in the through openings contained in said intermediate member, respectively, said plug member having at one end an end portion extending within the space defined between said intermediate member leg portions, said one end portion containing a plurality of second female contacts (6_1, 6_1') arranged colinearly opposite said first female contacts, respectively;

(f) a plurality of parallel male contacts (21_1, 21_1') mounted on said base member, said male contacts extending at one end completely through said first female contacts and into the corresponding second female contacts, respectively, said male contacts being adapted for connection at their other ends with conductors on the printed circuit board; and

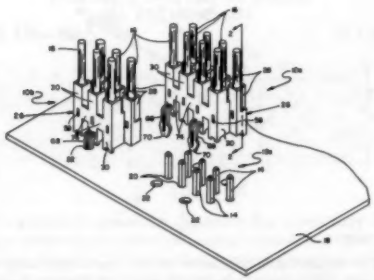
(g) short circuit means (S) contained in said intermediate member for establishing a short circuit between at least one pair of said first female contacts, thereby to short circuit the associated pair of male contacts and the printed circuit conductors associated therewith, said second female contacts being operable to directly receive said male contacts upon removal of said intermediate member from said base member and upon insertion of said plug member one end within the space defined between said base member leg portions.

4,693,532

MODULAR STAGGERED MULTI-ROW ELECTRICAL CONNECTOR

Stephen A. Colleran, Plainfield, and William R. Lenz, Crestwood, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Continuation of Ser. No. 698,504, Feb. 4, 1985, abandoned. This application Jul. 21, 1986, Ser. No. 887,968
Int. Cl.[4] H01R *11/22*
U.S. Cl. 439—594 5 Claims



1. A dual row, modular, mass terminatable electrical connector for connecting a dual row array of pins to insulated wire conductors, said connector including

a housing made of insulative material having parallel top and bottom rows of elongated terminal receiving cavities, each cavity generally defined between two spaced-apart sidewalls, a top wall and a bottom wall, each cavity having a forward pin receiving opening and a rear wire receiving opening, and

a plurality of identical terminals, one mounted with the same orientation in each cavity, and each terminal having a forward pin engaging portion and a rear insulation displacement slot for receiving an insulated conductor therein, displacing the insulation and electrically contacting the conductor,

the improvement comprising:

the cavities of the top row being staggered with respect to the cavities of the bottom row;

the sidewalls of adjacent cavities of the top and bottom rows being spaced-apart;

a slot formed in each of the top walls of the cavities of the top and bottom rows, each slot extending from the wire receiving opening toward the forward end to expose the insulation displacement slot, whereby the insulation displacement slots of the terminals received in the bottom row cavities are accessible between the sidewalls of adjacent top row cavities so that all of the terminals of both rows can be mass terminated from one direction; and

said housing having a plurality of modules, each module including at least one top row cavity and at least one bottom row cavity and selectively removable module connecting members joining predetermined adjacent cavity sidewalls for connecting a plurality of modules together, whereby a desired number of modules may be removed from the housing leaving a connector having the same number of pin receiving opeings as there are pins in a given pin array.

4,693,533

RIBBON CABLE CONNECTOR WITH IMPROVED COVER LATCH

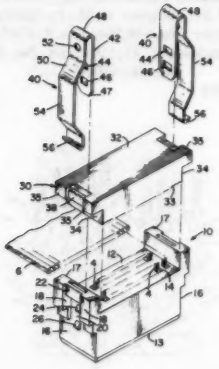
David S. Szczesny, Harrisburg, and John A. Root, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 778,095, Sep. 20, 1985, Pat. No. 4,621,885. This application Jun. 26, 1986, Ser. No. 878,766

The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.

Int. Cl.[4] H01R *4/24, 13/627*

U.S. Cl. 439—350 **15 Claims**



1. A ribbon cable connector of the type comprising a housing with insulation displacing contacts projecting from a top surface thereof, a cover having aperture means therein for receiving the contacts, and latch means at opposite ends of the connector effective to fix the cover in first and second latched positions relative to the housing, the cover being spaced from the top surface in the first position to permit alignment of the cable for termination, the cover being movable from the first position toward the top surface to terminate the cable, the cover securing the cable in terminated condition at the second position, the latch means comprises a pair of latch members fixed to the cover at respective opposite ends thereof, each latch member having a first latch arm cooperable with respective ends of the housing to effect latching at the first and second positions, each latch member further comprising a second latch arm adjacent the first latch arm and spaced from the housing, the second latch arms being cooperable with a complementary connector to retain the ribbon cable connector thereto, the connector being characterized in that:

first means are provided by the cover and the latch members securing the cover and latch members together, and as the cover is moved between the first position and the second position, the latch members move accordingly, the cover and the latch members being secured together by the first means; and

second means are provided by the first latch arms and the housing such that as the cover is moved between the first position and the second position, the latch member is permitted to move accordingly, as the second position is reached the second means secures the cover in the second position.

4,693,534

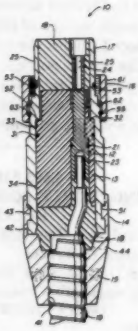
ELECTRIC FED-THRU CONNECTOR ASSEMBLY

Bill W. Clark, Houston, Tex., assignor to Seaboard Wellhead Control, Inc., Houston, Tex.

Continuation of Ser. No. 651,170, Sep. 17, 1984, abandoned. This application Jan. 22, 1986, Ser. No. 821,037

Int. Cl.[4] H01R *4/00*

U.S. Cl. 439—276 **40 Claims**



1. Integral electrical connection apparatus for feeding electricity between a very high fluid pressure zone and a low fluid pressure zone, comprising:

(a) an elongated mandrel sleeve having an internal sleeve shoulder formed therein and facing the high pressure end of said mandrel sleeve, said mandrel sleeve being externally adapted for sealed mechanical connection into high pressure equipment;

(b) an elongated pre-formed rigid high mechanical strength dielectric insulator support means having an external insulator shoulder installed within said mandrel sleeve with said insulator shoulder in abutment with said internal shoulder of said sleeve;

(c) said insulator support means being mounted in sealed and physically bonded relation within the interior of said mandrel sleeve by means of a dielectric potting material disposed as a insulator film in the surface areas between said insulator support means and said mandrel sleeve;

(d) said insulator support means having a plurality of holes

axially extending in parallel and laterally spaced apart relation through said insulator means with each hole of said holes having an internal hole shoulder formed therein and facing the high pressure end of said sleeve;

(e) an elongated rigid electrical conductor member having an external conductor shoulder and with electrical connectors on each end installed within each said hole with said conductor shoulder in abutment with said hole shoulder;

(f) said each electrical conductor member being mounted in sealed and physically bonded relation with the interior of said hole by means of a dielectric potting material disposed as a conductor film in the surface areas between said conductor member and the side of said hole;

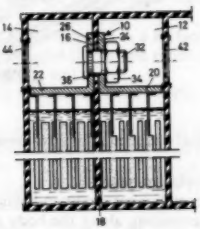
(g) said insulator support means and said conductor members as specified being provided within said mandrel sleeve to seal off fluids from flow through said mandrel sleeve limited only by a fluid pressure level sufficiently high to cause physical failure of the material of said insulator support means.

4,693,535

TERMINAL CONNECTOR FOR AN ELECTROCHEMICAL ACCUMULATOR BATTERY

Per E. Frode, Mockebo, Sweden, assignor to SAB Nife AB, Landskrona, Sweden

Filed Oct. 9, 1985, Ser. No. 785,791
Claims priority, application Sweden, Oct. 29, 1984, 8405403
Int. Cl.[4] H01R *4/00*
U.S. Cl. 439—277 **6 Claims**



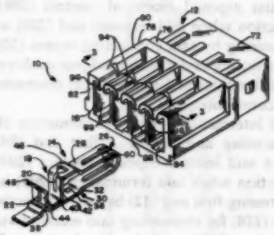
1. A connection in an electrochemical accumulator battery for sealed lead-through of a screw-joint providing an electrical connection between two adjacent cells through an opening in a cell wall said connection comprising: a cell wall made of plastic material and having an opening, a pair of plate group busses each connecting a plurality of electrode plates, each plate group bus having a leg parallel with the cell wall and positioned on opposite sides of the wall, and each said leg having an opening aligned with the wall opening, and a screw having a threaded body portion and a head portion and extending through the openings in the wall and in the plate group busses to define a screw-joint, a nut engageable with the threaded body of the screw for holding the joint together, an annular spacer having an external diameter greater than those of the openings in the plate group bus legs and smaller than the diameter of the cell wall opening and having a thickness smaller than the thickness of the cell wall and made of a harder material than the cell wall material, said spacer carried around the body portion of the screw and positioned in the opening in the cell wall, wherein each leg of the plate group bus is arranged tightly against a side of the cell wall and is forced by the screw-joint against the spacer, an interjacent part of the cell wall between the plate group bus legs being deformable and acting as a sealing gasket between the two legs.

4,693,536

INSULATION DISPLACEMENT TERMINAL

Stephen A. Colleran, Lisle, and Connie Doles, La Grange Park, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Jun. 12, 1986, Ser. No. 873,574
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—404 **6 Claims**



1. A unitary, integrally-formed electrical terminal adapted to be mounted in a connector housing cavity for interconnecting an insulated conductor and a contact member, said terminal being a continuous strip of metal having an insulation displacement contact portion adapted to receive the insulated conductor, a second contact portion adapted to make electrical contact with the contact member, and a connecting portion extending between said insulation displacement contact portion and said second contact portion, and the improvement characterized by:

said insulation displacement contact portion being generally upwardly directed U-shaped with a lower base and spaced first and second upstanding legs;

said connecting portion extending from an upper end of said first leg;

a first insulation displacement slot in said first leg extending into said connecting portion and downwardly from the upper end of the first leg toward the base; and

a second insulation displacement slot in said second leg extending downwardly from an open upper end of said second leg toward the base;

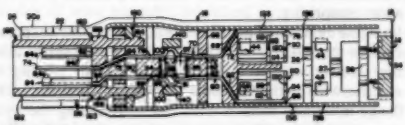
whereby an electrical terminal including an in-line insulation displacement contact portion having small space requirements is provided.

4,693,537

ELECTRICAL CONNECTOR

Jeffrey P. Dinsmore, and George B. Pfeffer, both of Minnetonka, Minn., assignors to ADC Telecommunications, Inc., Minneapolis, Minn.

Filed Jul. 7, 1986, Ser. No. 882,530
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—399 **13 Claims**



1. An electrical connector apparatus for electrically connecting a twisted pair cable (**300**) and a terminal end (**200**) of a jack where the end (**200**) has a first exposed electrical contact (**206**) and a second exposed electrical contact (**208**) and said twisted pair cable (**300**) includes a first conductor (**301**) and a second conductor (**302**), said apparatus comprising:

a housing having a first end (**12**) for releasably receiving said terminal end (**200**) and a second end (**14**) for receiving said

first and second conductors (301, 302) of said twisted pair cable (300);

connecting means (20) for releasably connecting said terminal end (200) to said housing first end (12) with said terminal end (200) and said housing first end (12) maintained in predetermined alignment;

a first intermediate electrical connector (70) carried by said housing and having a first end (74) disposed to contact said first exposed electrical contact (206) in electrical connection when said terminal end (200) is connected to said housing by said connecting means (20), means (110) for connecting said first twisted pair cable conductor (301) to said first intermediate electrical connector (70) in electrical connection; and

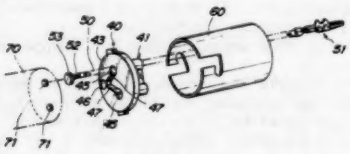
a second intermediate electrical connector (80) carried by said housing and having a first end (84) disposed to contact said second exposed contact (208) in electrical connection when said terminal end (200) is connected to said housing first end (12) by said connecting means (20), means (110) for connecting said second twisted pair cable conductor (302) to said second intermediate electrical connector (80) in electrical connection.

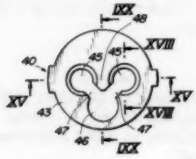
4,693,538

INSULATOR FOR ELECTRIC TERMINAL ATTACHED TO ELECTRIC WIRE

Hiroyoshi Matsuo, Chigasaki, Japan, assignor to Shiba Seisakusho Limited Responsibility Company, Ebina, Japan

Filed May 2, 1986, Ser. No. 859,157
Int. Cl.[4] H01R *13/422, 13/58, 17/04*
U.S. Cl. 439—460 **10 Claims**





1. An insulator for an electric terminal attached to an electric wire, comprising:

at least one cylindrical member having a first hole adapted to receive the electric wire therein, and a first slit to allow the electric wire to pass therethrough for placing the electric wire in the first hole through the first slit, and

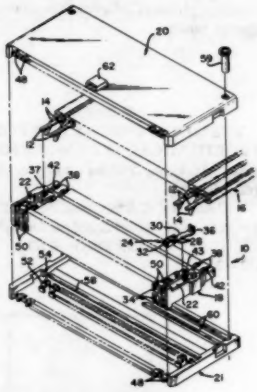
a flange integrally formed with and surrounding the cylindrical member and having at least one second hole aligned with the first hole of the cylindrical member, the diameter of the second hole being slightly larger than that of the first hole so that the electric terminal can be located in the second hole, a third hole having a diameter larger than that of the electric terminal to allow the electric terminal with the electric wire to pass longitudinally therethrough, and at least one second slit formed between the second and third holes and aligned with the first slit to allow the electric wire to pass laterally through said first and second slits so that the electric terminal is located in the second hole and the electric wire is located in the first hole.

4,693,539

RIBBON COAX CABLE CONNECTOR

Charles I. Tighe, Jr., Hershey, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 789,915, Oct. 17, 1985, abandoned, which is a continuation of Ser. No. 565,510, Dec. 27, 1983, abandoned. This application Jan. 12, 1987, Ser. No. 6,269
Int. Cl.[4] H01R *13/58*
U.S. Cl. 439—465 **9 Claims**



1. An electrical connector for a transmission cable comprising;

a body of insulative material,

conductor receiving passageways having a bottom wall and sidewalls extending along the body for snugly receiving corresponding electrical conductors of the transmission cable therealong,

terminal receiving passageways extending along the body and aligned with corresponding conductor receiving passageways,

conductive electrical terminals in the terminal receiving passageways having conductor terminating section means for electrical connection with corresponding electrical conductors of the transmission cable,

cover means for securing onto said body and covering the terminal receiving passageways and the conductor receiving passageways,

conductor strain relief means on said cover means for maintaining said conductor terminating section means connected with corresponding electrical conductors of the transmission cable,

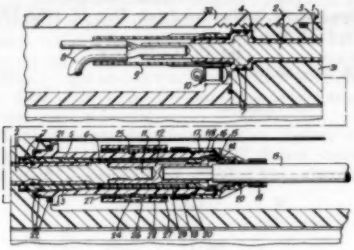
cable strain relief means for engaging the transmission cable, and

conductor receiving recess means in the sidewalls of the conductor receiving passageways between said conductor strain relief means and said cable strain relief means to accommodate movement of conductors received in said conductor receiving passageways because of temperature variation or twisting of the transmission cable that includes said conductors received in said conductor receiving passageways.

4,693,540
PRESSURE REGULATING DEVICES

Michael R. Cane, Prescot, England, assignor to BICC Public Limited Company, London, England

Filed Mar. 12, 1984, Ser. No. 588,807
Claims priority, application United Kingdom, Mar. 31, 1983, 8308977
Int. Cl.[4] H01R *13/52*
U.S. Cl. 439—198 8 Claims



5. An electric connector for service in an ambient medium under predetermined conditions of elevated temperature and elevated pressure, said elevated pressure being many times greater than atmospheric pressure, said connector comprising electrical connecting means and a fluid-tight housing which encloses said electrical connecting means and is fitted with at least one pressure-regulating device for substantially avoiding pressure difference between the inside of the connector and the surrounding ambient medium, said pressure-regulating device comprising:

a solid body with a shallow recess in a surface thereof;

a diaphragm sealed peripherally to said recess to partition it from ambient medium; and

a passage connecting said recess to the interior of said housing;

wherein said diaphragm is flexible such that on application of an elevated ambient pressure it will enter the recess and reduce its volume by a substantial amount, and further wherein said housing is filled with a major volume of fluid and a minor volume of gas, the relation of said major volume to said minor volume being such that said fluid will expand on heating from ordinary atmospheric temperature to said predetermined condition of elevated temperature by a volume increment substantially equal to said minor volume so as to return said diaphragm to a position where it does not enter the recess;

whereby said diaphragm is substantially free of stress under both said predetermined conditions of elevated temperature and elevated pressure and under ordinary atmospheric conditions of temperature and pressure.

4,693,541
ELECTRICAL ORNAMENTATION SYSTEM

Robert E. Sanders, Lenexa, Kans.; Jerry L. Knipp, Grandview, and Charles J. Flynn, Kansas City, both of Mo., assignors to Hallmark Cards, Inc., Kansas City, Mo.

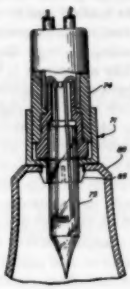
Continuation-in-part of Ser. No. 508,522, Jun. 27, 1983, Pat. No. 4,544,218. This application Jun. 21, 1985, Ser. No. 747,647
Int. Cl.[4] H01R *13/60*
U.S. Cl. 439—541 14 Claims

1. In combination:

a decorative ornament with an aperture therein for receiving an electrical lamp;

a connector cable assembly for electrical connection of said decorative ornament to a string of conventional sockets for miniature Christmas lights or the like, the connector cable assembly having means at one end adapted for electrically mating with a selected one of said sockets and having an electrical socket at an opposite end adapted to receive a miniature light; and

coupling means for coupling said socket of said assembly to said ornament aperture comprising a hollow cylindrical outer portion for receiving and holding the connector

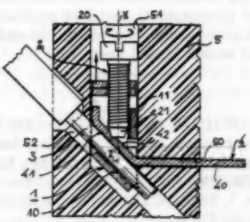


socket and a hollow cylindrical inner portion for extending axially beyond one end of said outer portion and receiving said miniature light, said inner portion being adapted to mate with said ornament aperture and to hold said miniature light secured in said aperture, said coupling means being constructed of a heat conductive material.

4,693,542
ELECTRICAL SCREW CONNECTION

Jean-Paul Heng, Lyons; André Marmonier, Bron; Ariel Ruiz, Villeurbanne, and Henri Guernet, Lyons, all of France, assignors to Cgee Alsthom, Levallois-Perret, France

Filed Dec. 12, 1985, Ser. No. 808,698
Claims priority, application France, Dec. 12, 1984, 84 18998
Int. Cl.[4] H01R *4/36*
U.S. Cl. 439—626 5 Claims



1. A screw connection which places a conductor wire into electrical connection with a conductor strip of an electrical apparatus at least partially contained in a housing made of insulating material, said housing including a first duct and an oblique second duct, said oblique second duct intersecting said first duct at an acute angle at one end to close off said one end of said first duct, said screw connection comprising:

a cage including an inside wire-gripping surface,

a clamping screw screwably mounted to said cage,

said conductor strip having a screw-engaging surface on one side thereof and a wire-gripping surface on an opposite side thereof facing said cage wire-gripping surface,

said screw having a shank end and a leading end, said screw leading end being screwed into said cage, and thrust against said screw-engaging surface of said conductor strip in order to electrically connect said conductor wire to said conductor strip by gripping said wire between said wire-gripping surface of said conductor strip and said inside, wire-gripping surface of said cage which extends

generally parallel to said wire-gripping surface of said conductor strip,

said clamping screw having a screw axis which extends at an acute angle relative to said generally parallel wire-gripping surfaces,

said cage including at least one lateral screw-backing element for engaging said clamping screw at least in the vicinity of its leading end to oppose the traverse component of the reaction between said screw and said connector strip tending to urge the leading end of the screw sideways while said screw is being tightened by virtue of said angle between and screw and said screw-engaging surface of said strip, said cage being made of a cut and folded metal sheet comprising a pair of parallel webs interconnected at one end by an obliquely disposed web forming said wire-gripping surface of said cage, and being interconnected at an opposite end by at least one web which extends perpendicularly to said pair of parallel webs and which includes a tapped hole holding and positioning said clamping screw so that said clamping screw extends parallel to said pair of parallel webs, each of said parallel webs including a lateral projection folded against the shank of the screw at least in the vicinity of its leading end pressed against said conductor strip and constituting said at least one lateral screw backing element to avoid setting up a rotary couple between said screw shank and said conductor strip, said cage being placed in said first duct and said cage and said first duct being configured and sized so as to enable limited axial displacement of said cage relative to said strip along said screw axis between positions which correspond to extreme positions for a gap existing between said wire-gripping surfaces of said cage and said strip, and said first duct provides access to turn the screw, said wire-gripping surfaces of said strip and of the cage being disposed opposite an opening of said second duct, said second duct constituting a wire-access duct passing obliquely through said housing in a direction which is parallel to said wire-gripping surfaces, and said conductor strip being carried by a third duct within said insulating material housing intersecting said first and second ducts, and said conductor strip having a portion projecting into said first duct at the intersection of said first and second ducts, and said conductor strip portion extending obliquely parallel to said obliquely disposed web and to said second duct.

4,693,543

OPTICAL INTEGRATED CIRCUIT

Hiroyoshi Matsumura, Saitama, and Koji Ishida, Musashino, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

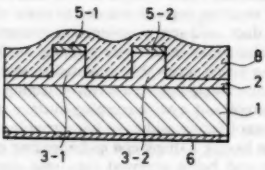
PCT No. PCT/JP84/00311, § 371 Date Mar. 7, 1985, § 102(e) Date Mar. 7, 1985, PCT Pub. No. WO85/00431, PCT Pub. Date Jan. 31, 1985

PCT Filed Jun. 15, 1984, Ser. No. 711,507

Claims priority, application Japan, Jul. 8, 1983, 58-123239

Int. Cl.[4] G02B *6/12*

U.S. Cl. 350—96.11 **2 Claims**



1. In an optical integrated circuit including a substrate, a ridge and an optical waveguide layer, the improvement comprising a hardened film of a heat-resistant, high-molecular weight resin formed over said ridge and said optical waveguide layer.

4,693,544

OPTICAL BRANCHING DEVICE WITH INTERNAL WAVEGUIDE

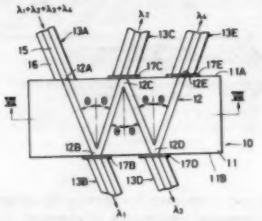
Tetsuya Yamasaki, Amagasaki, and Eiji Okuda, Itami, both of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Dec. 6, 1983, Ser. No. 558,507

Claims priority, application Japan, Dec. 14, 1982, 57-218902; Jan. 19, 1983, 58-6775

Int. Cl.[4] G02B *6/28*

U.S. Cl. 350—96.16 **12 Claims**



3. An optical waveguide device comprising a region formed in a transparent substrate, the region having a refractive index higher than a refractive index of the transparent substrate and defining an optical waveguide within the transparent substrate, said optical waveguide having first and second optical waveguide elements, each of the waveguide elements having one end connected to the one end of the other optical waveguide element in a substantially V-shape in the vicinity of a first surface of said transparent substrate, a connecting portion of the connected ends of the two optical waveguide elements being exposed to the first surface of said transparent substrate; and

wherein an axis of each of said optical waveguide elements lies within an imaginary plane perpendicular to the first surface of said transparent substrate and is inclined at the same angle with respect to a line normal to the first surface of said transparent substrate, and the axes of the first and second optical waveguide elements also intersecting one another at the surface of the transparent substrate where the connecting portion is exposed;

wherein an optical filter is arranged on each surface portion of said transparent substrate where the connecting portion is exposed; and

wherein the optical filter transmits light of predetermined wavelengths and reflects light of other wavelengths, respectively.

4,693,545

APPARATUS FOR THE CONTROLLED TRANSMISSION OF LIGHT

Tom Henningsen, Monroeville Boro, and Theresa A. Gould, Wilkinsburg, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 4, 1984, Ser. No. 646,723

Int. Cl.[4] G02B *6/12*

U.S. Cl. 350—96.12 **45 Claims**

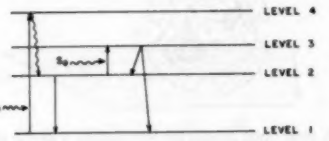
1. Apparatus for controlling the transmission of radiant energy comprising:

a light transmissive medium in communication with a means for introducing a first flux of photons, or the evanescent field thereof, into said medium, said photons having energy E, and said medium having energy level characteristics such that the energy, E, of said first flux of photons matches an energy gap between an energy level desig-

nated as energy level 2 and another energy level designated as energy level 3 of said medium, and said first flux is substantially unattenuated as said first flux of photons, or the evanescent field thereof, passes through said medium; and

means in communication with said medium for selectively introducing a second flux of photons, or the evanescent field thereof, into said medium to attenuate said first flux of photons, said second flux of photons causing the population of energy level 2 of said medium, wherein a portion of said first flux is absorbed, inducing a population in level 3, a portion of which population in level 3 returns to level 2 and is available for further attenuation of said first flux, whereby the control of the transmission of said first flux of photons by said second flux of photons is more efficient than if the return of excited states from level 3 to level 2 did not occur;

and furthermore, the introduction of n_1 photons of said second flux, or the evanescent field thereof, causes the absorption of n_2 photons of said first flux, wherein n_2 is



greater than n_1, when $\tau_p^{-1} >> \tau_2^{-1}$, $k \cong 0.90$, $\tau_{31}^{-1}/\tau_3^{-1} \cong 0.80$, and $\tau_2^{-1}/(\gamma\sigma_{23}S_f) \leqq 0.01$, where τ_p^{-1} is the pulse rate of said second flux, τ_2^{-1} is the spontaneous decay rate from level 2, k is the fraction of said second flux which is absorbed in populating level two of said medium, τ_{31}^{-1} is the decay rate for direct transistions from level 3 to level 1, $\tau_3^{31\ 1}$ is the overall spontaneous decay rate from level 3, $\gamma\sigma_{23}$ is the effective cross section for absorption of said first flux in inducing transitions from level 2 to level 3, where $\gamma = 1$ if said first flux is introduced directly into said medium, and $\gamma < 1$ if the evanescent field of said first flux is introduced into said medium, and S_f is the final number of photons per square centimeter per second in said first flux after said first flux, or the evanescent field thereof, has passed through said medium;

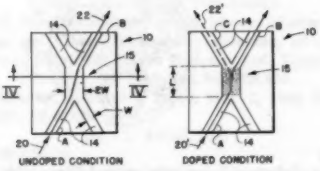
and wherein the introduction of said second flux, or the evanescent field thereof, causes the absorption of n_2 photons of said first flux, wherein n_2 is greater than n_1, when $\tau_p^{-1} >> \tau_2^{-1}$, $k \cong 0.90$, $\tau_{31}^{-1}/\tau_3^{-1} \cong 0.80$, and $\tau_p^{-1}/(\gamma\sigma_{23}S_f) \leqq 0.01$.

4,693,546

GUIDED-WAVE OPTICAL POWER DIVIDER

Joseph P. Lorenzo, Stow, and Richard A. Soref, Newton Centre, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 24, 1986, Ser. No. 831,902
Int. Cl.[4] G02B *6/10*
U.S. Cl. 350—96.13 **16 Claims**



1. A guided-wave optical power divider, comprising:

a body made up entirely of crystalline silicon;

an intersecting channel waveguide structure having a first leg and at least two other legs formed within said silicon body, said legs intersecting to form an intersection crossover region of predetermined size; and

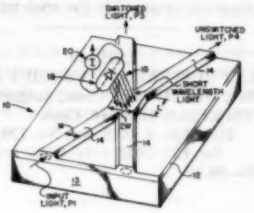
said crossover region being doped with a predetermined amount of impurities, said predetermined amount of impurities being sufficient to change the cross-coupling of light between said first leg and said two other legs.

4,693,547

OPTICALLY CONTROLLED INTEGRATED OPTICAL SWITCH

Richard A. Soref, Newton Centre, and Joseph P. Lorenzo, Stow, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 24, 1986, Ser. No. 831,910
Int. Cl.[4] G02B *6/10*
U.S. Cl. 350—96.13 **19 Claims**



1. An optically-controlled integrated optical switch, comprising:

a body made up entirely of crystalline silicon:

an X like channel waveguide structure having a first leg and a second leg formed within said silicon body, said first and said second legs intersecting to form an intersection crossover region of predetermined size; and

means for providing a beam of light impinging on said intersection crossover region in order to alter the index of refraction of said silicon body and therefore changing the cross-coupling of light between said first leg and said second leg of said X-like channel waveguide structure.

4,693,548

DEVICE FOR RECORDING INFORMATION ON A PHOTOSENSITIVE MEDIUM FOR ELECTROPHOTOGRAPHY

Haruo Tsunoi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 350,062, Feb. 18, 1982, abandoned.
This application Jan. 25, 1985, Ser. No. 694,905
Claims priority, application Japan, Feb. 27, 1981, 56-27762
Int. Cl.[4] G02B *6/10*; G03G *15/00*; G01D *9/04*
U.S. Cl. 350—96.13 **4 Claims**

1. A device for recording information on a photosensitive member, comprising:

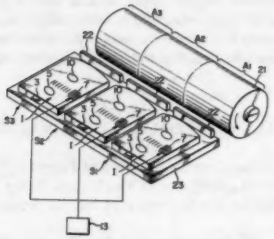
a plurality of independently controlled light sources;

a plurality of waveguides, each having a length and a width and being adapted to propagate a light beam from an associated said light source along the lengthwise direction, said waveguides being arranged with their widths extending in a predetermined direction such that the widths of said waveguides lie along a line;

deflecting means for deflecting, in the predetermined direction, the light beams propagated by said respective waveguides;

a plurality of internal lens systems, one said internal lens system being provided in each of said waveguides; and

an external lens system for condensing deflected light beams emerging from said waveguides, in cooperation with said internal lens systems, on the photosensitive member such



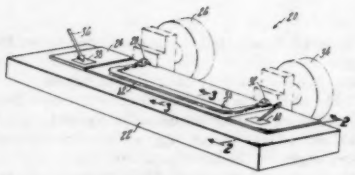
that areas on the photosensitive member exposed by the deflected light beams emerging from said waveguides are larger than the width of any one of said waveguides and are cotinuously arranged in the predetermined direction.

4,693,549

OPTICALLY BUFFERED WAVEGUIDE MODULATOR

Peter K. Cheo, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 4, 1985, Ser. No. 720,196
Int. Cl.[4] G02B *6/14*; G02F *1/00*
U.S. Cl. 350—96.14 **12 Claims**



1. An infrared electro-optic modulator comprising:

an optical waveguide slab having substantially parallel top and bottom surfaces, a predetermined waveguide index of refraction in a predetermined optical wavelength range that determines a waveguide phase velocity of light in said wavelength range, a predetermined waveguide dielectric constant, and a predetermined waveguide thickness along an axis perpendicular to said top and bottom surfaces;

a top optical buffer layer adjacent said top surface, having a buffer index of refraction in said predetermined optical wavelength range that is less than said waveguide index of refraction, a predetermined buffer layer dielectric constant, and a predetermined buffer thickness;

a top electrode, having a predetermined electrode width along a transverse direction perpendicular to said axis and a predetermined electrode length along a longitudinal direction perpendicular to both said axis and said transverse direction, disposed on said top optical buffer layer; and

a bottom electrode disposed below said optical waveguide slab, characterized in that;

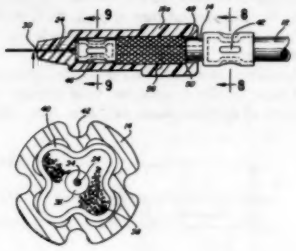
a bottom optical buffer layer is formed adjacent said bottom surface and disposed above said bottom electrode, also having said buffer index of refraction, said buffer layer dielectric constant and said buffer thickness; and said waveguide thickness and said buffer thickness of said top and bottom optical buffer layers combine with said top and bottom electrodes to form a microwave transmission line having a predetermined phase velocity for traveling wave microwave signals that is substantially equal to said predetermined waveguide phase velocity of light.

4,693,550

CRIMP TYPE FIBER OPTIC CONNECTOR

Vincent B. Brown, Prospect Heights, and Sherman W. McGrew, Chicago, both of Ill., assignors to Methode Electronics, Inc., Chicago, Ill.

Filed Mar. 11, 1985, Ser. No. 710,317
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **11 Claims**



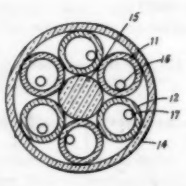
8. A fiber optic connector terminating a length of fiber optic cable having a central fiber optic core covered by cladding, a buffer outside of the cladding, and additional layers of material covering the buffer, said connector comprising, in combination, a fiber optic cable end having a first, outermost end portion stripped of all material outside of said cladding, a second, intermediate end portion stripped of all material outside of said buffer, and a third cable end portion which includes additional layers of material outside of said buffer, ductile metal sleeve means extending over said first, second, and third cable end portions, a resilient tubular insert positioned within the outer end of said ductile metal sleeve means to surround at least a portion of said first, outermost end portion of said cable which is within said sleeve means, said ductile metal sleeve means being crimped at the location of said resilient tubular insert to hold said sleeve means, said insert, and said first outermost end portion in immovable relation, and said ductile metal sleeve means being also crimped at the location of said third cable end portion, whereby said first, outermost cable end portion can abut the end of another optic cable for optical connection.

4,693,551

DIELECTRIC STRENGTH ELEMENTS FOR LOOSE TUBE OPTICAL FIBER CABLE

Carlos Blanco, Roanoke; Adolf R. Asam, Botetourt, and John C. Smith, Roanoke, all of Va., assignors to U.S. Holding Company, Inc., New York, N.Y.

Filed Oct. 5, 1983, Ser. No. 539,344
Int. Cl.[4] G02B *6/44*
U.S. Cl. 350—96.23 **17 Claims**



1. In a dielectric loose tube optical fiber cable having a tubular outer covering and containing a central strength member of a dielectric material, with a plurality of peripheral hol-

low fiber containing tubes surrounding said central member and positioned between said central member and said outer covering the improvement therewith comprising:

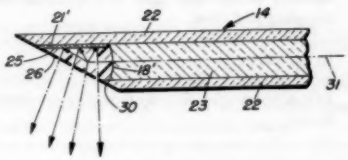
each of said plurality of said hollow fiber containing tubes being fabricated in a single layer of plastic having embedded therein a plurality of glass fibers substantially oriented in the longitudinal direction along said tube, said hollow fiber containing tubes contributing to the strength of said cable allowing said central strength member to have a reduced cross sectional area.

4,693,552

OPTICAL APPARATUS

Richard V. Jeskey, Fiskdale, Mass., assignor to Incom, Inc., Southbridge, Mass.

Continuation-in-part of Ser. No. 442,512, Nov. 18, 1982, which is a continuation of Ser. No. 427,789, Sep. 29, 1982, abandoned.
This application Aug. 4, 1983, Ser. No. 520,152
Int. Cl.[4] G02B *6/06*
U.S. Cl. 350—96.24 **8 Claims**



1. An optical apparatus for receiving an optical image at a first end and for producing an expanded form of the optical image at a second end, comprising:

a plurality of optical fibers of uniform cross-section extending from said first end to said second end, each fiber having a core and cladding and an axis in the neighborhood of the second end, each fiber adapted to transmit light from the first end to the second end,

the fibers formed into a plurality of rows, the fibers in a given row being held in a uniformly adjacent configuration,

the several rows being held in close proximity at the first end and separated by spacers at the second end,

all the rows of the fibers together being cut at the second end at a narrow angle to their axes to provide a broad emission surface at the end of each fiber, the surfaces being co-planar with each other to form an expanded image plane, each surface having a center, the widths of the spacers being such as to make the center-to-center distance between the adjacent rows at the second end the same as the distance between the centers of the faces of the adjacent fibers on the same row, so that the image at the second end is and undistorted form of the image at the first end, each of the fibers at its second end being provided with light diffusing element integrally formed at the fiber end to disperse light from the second end and providing a non-directional field of view for the expanded image.

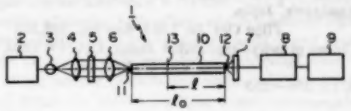
4,693,553

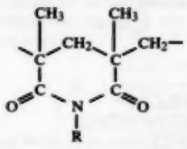
LIGHT-TRANSMITTING FIBER

Isao Sasaki, Hiroshima; Kozi Nishida; Masaru Morimoto, both of Otake, and Takashi Yamamoto, Hiroshima, all of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Filed Feb. 26, 1985, Ser. No. 705,634
Claims priority, application Japan, Mar. 2, 1984, 59-40077; Mar. 5, 1984, 59-41825
Int. Cl.[4] D02G *3/00*
U.S. Cl. 350—96.34 **9 Claims**

1. A light-transmitting fiber comprising a core component and a sheath component covering the core component, the core component consisting essentially of a polymer comprising 2% to 100% by weight of ring structure units represented by the following general formula (I):





(I)

wherein R stands for a hydrogen atom or an aliphatic, alicyclic, or aromatic hydrocarbon group having 1 to 20 carbon atoms,

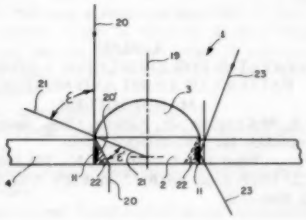
and 0% to 98% by weight of monomer units composed mainly of methyl methacrylate, and the sheath component being composed of a polymer having a refractive index smaller by at least 1% than that of the polymer of the core component.

4,693,554

SENSOR MAGNIFYING GLASS APPARATUS

Werner Cordes, Hamburg, Fed. Rep. of Germany, assignor to Aristo Graphic SySteme GmbH & Co. KG, Fed. Rep. of Germany

Filed Jun. 9, 1986, Ser. No. 871,986
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520293
Int. Cl.[4] G02B *7/02*; G08C *21/00*
U.S. Cl. 350—244 **6 Claims**

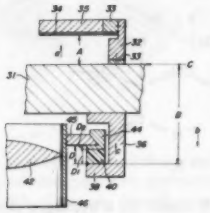


1. A sensor magnifying glass comprising a magnifying glass element held in a holder element, said magnifying glass element having a cylindrical portion and a convexly curved lens portion superposed thereon which is rotationally symmetrical with respect to the cylinder axis, said sensor magnifying glass further having a plotter coil disposed coaxially with the cylindrical portion, characterized in that the plotter coil (11) is secured on the cylindrical portion (2) in the region between the circumferential face of the cylindrical portion (2) and the course of a peripheral light ray (20') entering an outer edge of the lens portion (3) as it passes through the cylindrical portion (2).

4,693,555
DEVICE FOR HOLDING AN IMAGING LENS

Noboru Arai, and Takekazu Yanagimoto, both of Ashigara-Kami, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 18, 1985, Ser. No. 789,291
Claims priority, application Japan, Oct. 19, 1984, 59-218289
Int. Cl.[4] G02B *7/02*
U.S. Cl. 350—253 **9 Claims**

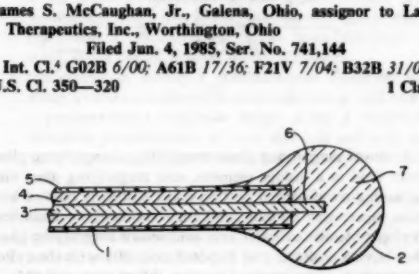


1. An imaging lens holder device comprising:
a substrate (31) having upper and lower surfaces and an optical window (43) therethrough;
holding means (35) for supporting a member (34) to be scanned;
leg members (32) extending from the upper surface of said substrate and attached to the holding means for supporting the holding means a predetermined distance from said substrate;
supporting legs (36, 37) having first and second ends and being attached to the lower surface of the substrate by said first ends;
ledges (38, 39) having upper and lower surfaces and integrally attached to the second end of said supporting legs;
an imaging lens holding means having an imaging lens (42) disposed therein in such a manner that a projection image formed by the imaging lens is formed on a surface of the member to be scanned through the optical window of the substrate; and
focus adjusting members (40,41) secured on the upper surfaces of said ledges and supporting the imaging lens holding means for correcting defocusing of the imaging lens resulting from dimensional change of the leg members, substrate and supporting legs due to changes in temperature.

4,693,556
APPARATUS FOR PRODUCING A SPHERICAL PATTERN OF LIGHT AND METHOD OF MANUFACTURE

James S. McCaughan, Jr., Galena, Ohio, assignor to Laser Therapeutics, Inc., Worthington, Ohio

Filed Jun. 4, 1985, Ser. No. 741,144
Int. Cl.[4] G02B *6/00*; A61B *17/36*; F21V *7/04*; B32B *31/00*
U.S. Cl. 350—320 **1 Claim**

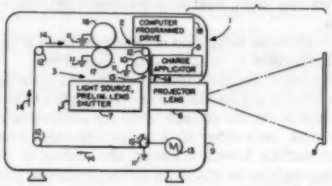


1. A process for manufacturing an apparatus for radiating light of sufficient intensity to cause photodynamic effects in an approximately uniform spherical pattern of approximately 4π steradians comprising the steps of:
(a) removing the cladding and sheathing from a region at one end of an optical fiber;
(b) polishing the smooth, exposed end of the core of said optical fiber exposed by said removal of said cladding and sheathing, making a reasonably smooth, flat surface thereon;
(c) coating said exposed core and said cladding and sheathing adjacent thereto with a light-scattering medium comprising an approximately equal mixture of powdered quartz and an optical adhesive curable by exposure to ultraviolet radiation, said light-scattering medium applied so as to have uniform scattering power in a spherical pattern around said exposed core and approximately centered thereon by means of the sub-steps;
(c-i) launching laser light into said optical fiber at the end opposite that end being coated, said light being of sufficient intensity to produce visible rays emanating from the region being coated;
(c-ii) coating said exposed core region with said light-scattering medium in an approximately spherical light scattering density as determined by an observed uniform intensity in said laser light in a spherical pattern surrounding said core;
(c-iii) curing said applied coating by exposure to ultraviolet radiation;
(c-iv) applying a plurality of additional layers of said light-scattering medium by repeating sub-steps (c-ii) and (c-iii).

4,693,557
LIQUID CRYSTAL MOTION PICTURE PROJECTOR

James L. Fergason, Atherton, Calif., assignor to Manchester R & D Partnership, Pepper Pike, Ohio

Continuation-in-part of Ser. No. 585,884, Mar. 2, 1984, Pat. No. 4,603,945, and Ser. No. 608,135, May 8, 1984, Pat. No. 4,613,207. This application Aug. 1, 1986, Ser. No. 892,497
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—331 R **29 Claims**



1. A liquid crystal moving picture projector comprising
liquid crystal imager means for creating characteristics of an image, and
projection optics means for projecting images sequentially created by the imager
said imager means including a continuous strip of liquid crystal material capable of temporarily sorting charge to create characteristics of an image capable of being projected by said projection optics means.

25. A method of projecting plural images in sequence, comprising:
creating an image or characteristics of an image in a liquid crystal material
storing such image by storing charge on a surface of such liquid crystal material,
directing light at such liquid crystal material,
projecting such image as a function of light transmitted through or scattered by such liquid crystal material, and
creating a further image on such liquid crystal material for subsequent projection.

4,693,558

GLARE PREVENTIVE REAR VIEW MIRROR

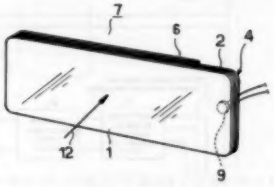
Junichi Nakaho; Shigeru Kato, and Makoto Shibahara, all of Ooguchi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Niwa, Japan

Filed Mar. 20, 1985, Ser. No. 713,684

Claims priority, application Japan, Mar. 28, 1984, 59-44794[U]

Int. Cl.[4] H01J *39/12*

U.S. Cl. 350—332 **2 Claims**



1. A glare preventive rear view mirror comprising:

a liquid crystal cell of the guest-host type including a pair of parallel transparent plates each having a transparent electrode on the inwardly desposed surface thereof and a mixture of nematic liquid crystal and dichroic dyestuff encapsulated between said transparent plates;

a mirror assembly including a quarter wave phase difference filter and a flat mirror each disposed on the side of said liquid crystal cell opposite a light receiving side thereof;

an optical polarization filter mounted on a side of said liquid crystal cell;

a photo-sensitive means for receiving light passing through at least said liquid crystal cell and said optical polarization filter, said photo-sensitive means being adapted to produce a photo-receptor signal in accordance with a quantity of received light; and

a control circuit means for controlling voltage applied to the electrodes of said liquid crystal cell so as to adjust the quantity of light passing through said liquid crystal cell and so that the magnitude of the photo-receptor signal can correspond with a predetermined level.

4,693,559

LIQUID-CRYSTAL CELL WITH DEPRESSIONS FOR WIDER VIEWING ANGLE

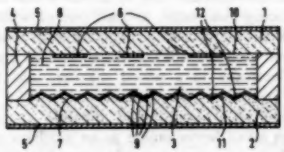
Holm Baeger, Schwalbach, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 4, 1985, Ser. No. 805,083

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1984, 3444525

Int. Cl.[4] G02F *1/133*

U.S. Cl. 350—334 **9 Claims**



1. In a liquid-crystal cell, particularly a TN-cell, having two transparent substrates arranged spaced from each other and forming between each other a cell space filled with liquid-crystal substance, polarizers positioned on sides of said substrates facing away from each other, and electrodes located on the sides facing each other, the improvement wherein

a substrate-side boundary layer of the cell space contiguous the liquid-crystal substance is formed with a plurality of depressions adjoining each other, said depressions covering substantially the entire boundary surface and having different depths at different places distributed over the extent of the surface of each depression, said depths constituting means for producing light colors corresponding to the total thicknesses of the layer of liquid-crystal present respectively in each of said places, and wherein the light colors include substantially the entire color spectrum within the region of the extent of the surface of each depression.

4,693,560

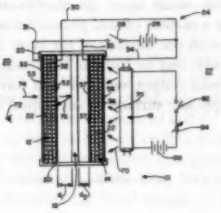
DOUBLE LAYER DISPLAY

Richard Wiley, Los Altos, Calif., assignor to Taliq Corporation, Sunnyvale, Calif.

Filed Sep. 25, 1986, Ser. No. 911,980

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—335 **20 Claims**



1. A display apparatus comprising:

a first liquid crystal means;

a second liquid crystal means spaced from said first liquid crystal means;

means disposed between said first and second liquid crystal means for both transmitting and reflecting light; and

said first and second liquid crystal means comprising liquid crystal material containing a dye that conforms to the structure of the liquid material and a containment medium means for inducing a distorted alignment of said liquid crystal material which in response to such alignment scatters and absorbs light and which in response to a prescribed input reduces the amount of such scattering and absorption.

10. A display apparatus comprising:

a first liquid crystal means disposed at a viewing side of the apparatus;

a second liquid crystal means spaced from said first liquid crystal means;

said first and second liquid crystal means comprising high birefringence operationally nematic liquid crystal containing a pleochroic dye and a containment medium means for containing plural volumes of the liquid crystal and dye, said containment medium means having surface means for distorting the natural structure of the liquid crystal to cause the dye to increase light absorption, and the liquid crystal being responsive to a prescribed input to reduce the amount of such light absorption;

transflector means partially reflective and partially transmissive for transmitting and reflecting light incident thereon, said transflector means disposed between said first and second liquid crystal means; and

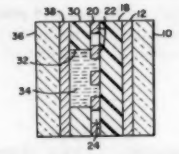
a source of backlight disposed at a non-viewing side of the apparatus.

4,693,561

AMORPHOUS SILICON SPATIAL LIGHT MODULATOR

Paul R. Ashley, Toney, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 23, 1985, Ser. No. 812,603
Int. Cl.[4] G02F 1/135; G02B 5/18
U.S. Cl. 350—336 4 Claims



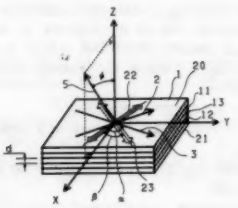
1. An amorphous silicon spatial light modulator comprising input and output end windows of light transparent material and a three electrode structure sandwiched between said windows and including a tin oxide sandwich layer on a surface of said input window, a photoconductor sandwich layer over a surface of said tin oxide layer, an aluminum grating structure mounted over a surface of said photoconductor layer, a liquid crystal layer with one surface of the layer in contact with the grating structure, and an Indium Tin Oxide layer mounted on a surface of said output window and having a surface that contacts an opposite surface of said liquid crystal.

4,693,562

LIQUID CRYSTAL DISPLAY DEVICE

Shinji Hasegawa; Yasuhiko Kando, and Tamihito Nakagomi, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 6, 1985, Ser. No. 805,787
Claims priority, application Japan, Dec. 7, 1984, 59-257547
Int. Cl.[4] G02F 1/137
U.S. Cl. 350—337 4 Claims



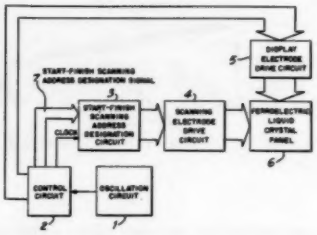
1. A liquid crystal display device wherein a nematic liquid crystal having a positive dielectric anisotropy and added with a chiral material is sealed between a pair of upper and lower substrates with electrodes thereon and orienting layers on the electrodes and exposed surfaces thereof so as to constitute a helical structure twisted within a range between 96° and 108° along a direction of thickness thereof, absorption axes of a pair of polarizing plates disposed on said upper and lower substrates constitute an angle between 63° and 73°, and a product Δn-d of a thickness d (μm) and an optical anisotropy Δn of a liquid crystal layer falls within a range from 0.69 μm to 0.79 μm.

4,693,563

FERRO-ELECTRIC LIQUID CRYSTAL ELECTRO-OPTICAL DEVICE

Takamasa Harada, and Masaaki Taguchi, both of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Jun. 28, 1985, Ser. No. 750,093
Claims priority, application Japan, Jul. 5, 1984, 59-139285
Int. Cl.[4] G02F 1/13
U.S. Cl. 350—350 S 20 Claims



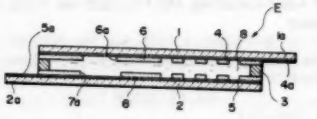
1. A ferro-electric liquid crystal electro-optical device driven in a time-sharing mode comprising: a panel having a plurality of scanning electrodes, a plurality of display electrodes and a ferro-electric liquid crystal material disposed between the scanning electrodes and the display electrodes; drive means for scanning the scanning electrodes and for feeding display data signals to the display electrodes so as to produce a picture on the panel; and control means for controlling said drive means to enable the same to scan only a part of the scanning electrodes for partially rewriting the picture produced by the panel.

4,693,564

ELECTROCHROMIC DISPLAY DEVICE

Hiroshi Mori, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 30, 1985, Ser. No. 793,127
Claims priority, application Japan, Oct. 31, 1984, 59-229714
Int. Cl.[4] G02F 1/17
U.S. Cl. 350—357 8 Claims

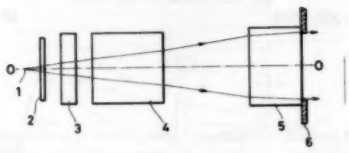


1. An electrochromic display device which comprises a cell having facing electrodes, at least one of which is a display electrode and which are spaced from each other, and an electrochromic solution filled between and in contact with the paired electrodes in a sealed manner, said electrochromic solution comprising an aqueous solution of an N,N'-di(p-cyanophenyl)-4,4'-bipyridinium dihalide as an active substance, an alkali ferrocyanide as an auxiliary redox material, and an electrolyte consisting of a hypophosphite ion and a salt corresponding to the salt obtained from the anion of the active substance and the alkali ion of the auxiliary redox material, said active substance being used in an amount of 0.005 to 0.035 M, said hypophosphite being used in an amount not less than 0.5M, said salt being used in an amount not less than 0.25M.

4,693,565
COLLIMATOR LENS

Hiroyuki Ichikawa, and Minoru Toyama, both of Takarazuka, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Apr. 28, 1986, Ser. No. 856,822
Claims priority, application Japan, May 7, 1985, 60-96424
Int. Cl.[4] G02B *3/00*
U.S. Cl. 350—413 **1 Claim**



1. A collimator lens of refractive index distribution type for an optical recording/reproducing apparatus, wherein the collimator lens is made of cylindrical transparent medium with an incident surface and an outgoing surface being in parallel with each other and having the refractive index n(r) at position of distance r from the center axis expressed by:

$$n^2(r)=n_0^2\{1-(g\cdot r)^2+h_4(g\cdot r)^4+h_6(g\cdot r)^6+h_8(g\cdot r)^8+\cdots\}$$

and further satisfies conditions that

$$R_1=R_2=\infty \quad (1)$$

$$1.40/\sqrt{1-(g\cdot r)^2}\leqq n_0\leqq 2.1 \quad (2)$$

$$1/\sqrt{f^2-23.43}\leqq n_0 g\leqq 1/(f\sin g)\ (\mathrm{mm}^{-1}) \quad (3)$$

$$0.23\leqq h_4\leqq 0.86 \quad (4)$$

$$1.5\leqq r_0\leqq 3.0\ (\mathrm{mm}) \quad (5)$$

$$0.13\leqq \mathrm{NA}\leqq 0.17 \quad (6)$$

$$|\theta|\leqq 50\ (\mathrm{minute}) \quad (7)$$

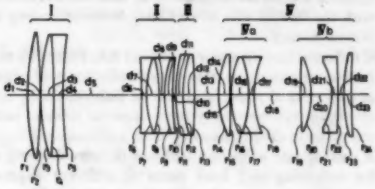
(where
n_0: refractive index on the center axis
g, h_4, h_6, h_8: refractive index distribution constants
R_1, R_2: curvature radii of incident surface and outgoing surface
f: focal length
r_0: lens radius
NA: numerical aperture at light source side
θ: angle of normal of incident and outgoing surfaces with respect to optical axis).

4,693,566
ZOOM LENS SYSTEM

Masaki Imaizumi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1984, Ser. No. 645,394
Claims priority, application Japan, Sep. 8, 1983, 58-164197
Int. Cl.[4] G02B *15/14*
U.S. Cl. 350—427 **5 Claims**

1. A zoom lens system comprising a vari-focal system and a relay lens system, comprising a first lens group having positive refractive power and comprising a cemented doublet, a second lens group having negative refractive power and comprising a cemented doublet, and a third lens group having positive refractive power, and said relay lens system comprising a front lens group having positive refractive power, and a rear lens group having positive refractive power comprising a plural number of lenses including at least one positive lens, said zoom lens system fulfilling the conditions (1), (2), (3) are (4) shown below:



$$\frac{n_I'-n_I}{r_I}f_I<-0.05 \quad (1)$$

$$1.0<\frac{f_{IVb}}{f_I}<2.0 \quad (2)$$

$$1.75<\frac{f_{IVb3}}{f_{IV}}<2.00 \quad (3)$$

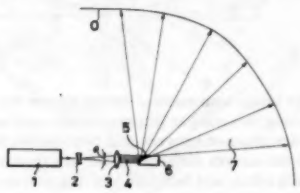
$$0.2<\frac{D}{f_{IV}}<0.3 \quad (4)$$

where, reference symbol f_I represents the focal length of the first lens group, reference symbol r_I represents the radius of curvature of the cemented surfaces of the cemented doublet in the first lens group, reference symbols n_I and n_I' respectively represent refractive indices of respective lens elements constituting the cemented doublet in the first lens group, reference f_{IV} represents the focal length of the relay lens system, reference symbol f_{IVb} represents the focal length of the rear lens group in the relay lens system, reference symbol f_{IVb3} represents the focal length of the positive lens arranged on the image side in the rear lens group in the relay lens system, and reference symbol D represents the airspace between the front and rear lens groups in the relay lens system.

4,693,567
APPARATUS FOR PROJECTING LUMINOUS LINES ON AN OBJECT BY A LASER BEAM

Yasuto Ozaki, 22-2, Horen-cho, Nara, Japan

Filed Aug. 17, 1983, Ser. No. 524,036
Claims priority, application Japan, Aug. 21, 1982, 57-144912; Apr. 22, 1983, 58-71746; Apr. 22, 1983, 58-71747
Int. Cl.[4] G02B *3/04*
U.S. Cl. 350—433 **2 Claims**



1. An apparatus for projecting luminous lines on an object by use of a laser beam, said apparatus comprising:
means for producing a laser beam;
means, located at a position subsequent to said producing means, for expanding said laser beam, said expanding means comprising concave lens means for diverging said laser beam, and convex lens means, positioned subsequent

to said concave lens means, for converging said laser beam to be of a maximum desired width;

a reflector having a central plane, said reflector being located at a position subsequent to said convex lens means with the optical axis of said laser beam extending in said central plane;

said reflector having a pair of curved side reflecting surfaces intersecting along an edge of said reflector, said edge lying in said central plane, said pair of side reflecting surfaces diverging symmetrically from opposite sides of said central plane in directions away from said convex lens means;

said pair of side reflecting surfaces thereby forming means for reflecting said laser beam at different angles with respect to said central plane, at respective different positions along said pair of said reflecting surfaces, and thus for reflecting a pair of sector-shaped luminous lines on an object, said sector-shaped luminous lines expanding symmetrically from said side reflecting surfaces;

said reflector having a curved top reflecting surface extending transverse to and intersecting said pair of side reflecting surfaces and extending perpendicular to said central plane, said central plane symmetrically bisecting said top reflecting surface; and

said top reflecting surface thereby forming means for reflecting said laser beam at different angles at respective different portions along said top reflecting surface, and thus for reflecting further sector-shaped luminous lines on the object, said further luminous lines expanding symmetrically from said top reflecting surface in directions perpendicular to said pair of sector-shaped luminous lines.

4,693,568

IMAGE TRANSMISSION OPTICAL SYSTEM FOR AN ENDOSCOPE

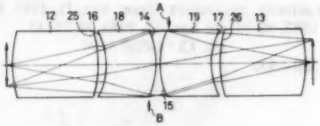
Susumu Takahashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 19, 1985, Ser. No. 777,679

Claims priority, application Japan, Sep. 25, 1984, 59-200140

Int. Cl.[4] G02B *9/34, 23/00*

U.S. Cl. 350—469 **11 Claims**



1. An image transmission optical system for an endoscope comprising two rod-like biconvex lenses, and two thick meniscus lenses disposed between said two rod-like biconvex lenses so that the convex surfaces of said two thick meniscus lenses face each other, said biconvex lens disposed on the object side of said two thick meniscus lenses being arranged at a position such that the peripheral rays of the offaxial rays transmitted by said system are limited by said convex surface of the one of said thick meniscus lenses located on the object side, said other of said two rod-like biconvex lenses being disposed on said image side of said two thick meniscus lenses and being disposed at a position such that radially inwardly located offaxial rays transmitted by said system are limited by said convex surface of said two thick mensicus lenses disposed on said image side.

4,693,569

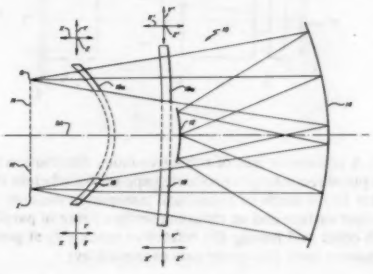
METHOD AND APPARATUS FOR OPTICAL SYSTEM ADJUSTMENTS

Abe Offner, Darien, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 106,415, Dec. 21, 1979, Pat. No. 4,293,189, which is a continuation-in-part of Ser. No. 938,569, Aug. 31, 1978, abandoned, which is a continuation-in-part of Ser. No. 767,906, Feb. 11, 1977, abandoned. This application Oct. 5, 1981, Ser. No. 308,647

Int. Cl.[4] G02B *17/08, 7/02*

U.S. Cl. 350—505 **13 Claims**



1. An annular field optical system having a broad spectral range and including at least one pair of refractive elements, said optical system comprising:

a first half and a second half, each half including an optical system having an optical axis and defining conjugate image and object planes substantially normal to said axis, the first half and second half being coaxially disposed in back-to-back relationship so that the conjugate planes are superposed on at least one side of the optical system, and means for providing spaced object and final image locations on the other side of the optical system, said optical system being constructed and arranged so that the Petzval sum is substantially zero, said pair of refractive elements being disposed in optical symmetry about an image plane or conjugate image planes and mounted for translational displacement along and/or rotational displacement about one or more of three orthogonal axes, said orthogonal axes consisting of said optical axis and axes parallel or orthogonal thereto, said pair of refractive elements being identical, nearly concentric menisci, the convex radii of which are longer than the concave and axial thickness of which is greater than the difference between the convex and concave radii and so shaped that their contributions to longitudinal aberrations are small while their contributions to lateral aberrations are either zero or equal and of opposite sense, the displacement being such in character, direction and extent as to enable correction of the system for deviations from theoretical design performance resulting from manufacturing errors in the optical components of the system and in their assembly and/or alignment.

4,693,570

SPORTS TRAINING APPARATUS

Ralph W. Kryder, 4481 S. Buffalo Rd., Orchard Park, N.Y. 14127

Continuation of Ser. No. 532,841, Sep. 16, 1983, abandoned. This application Apr. 29, 1986, Ser. No. 857,733

Int. Cl.[4] G02B *5/08, 5/10*

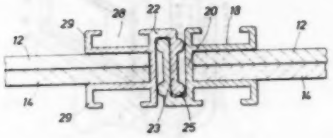
U.S. Cl. 350—616 **7 Claims**

1. A sports training apparatus comprising:

(a) a mirror assembly including a sheet of clear acrylic material and a sheet of mirrored acrylic material in facing contact;

(b) a frame extending about the edges of the acrylic sheets, said frame including interlocking channels extending about said frame and integral therewith, said interlocking channels cooperating together for joining at least two mirror assemblies end to end;

(c) means for mounting said assembly for use in various sports, and



(d) wherein said interlocking channels are formed by a leg member extending outwardly from and substantially perpendicular to a base member of said frame and a clamp member extending from said leg member spaced from and substantially parallel to said base member.

4,693,571

SUPPORT AND DRIVE UNIT FOR MIRROR DEVICES

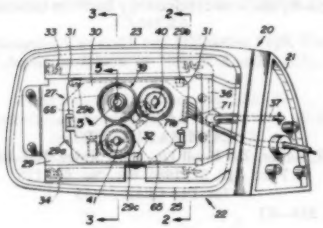
Sakae Kimura, Saitama, and Yasuhiro Tanaka, Miyazaki, both of Japan, assignors to Kabushiki Kaisha Matsuyama Seisakusho, Tokyo, Japan

Filed Jan. 23, 1985, Ser. No. 693,865

Claims priority, application Japan, Jan. 24, 1984, 59-11155; Jan. 24, 1984, 59-11156

Int. Cl.[4] G02B *5/08, 5/10*

U.S. Cl. 350—634 **11 Claims**



1. A support and drive unit for a mirror device having a housing and a mirror holder provided with a mirror, comprising:

(a) a casing adapted to be disposed in said housing;

(b) a support structure adapted to pivotally support said mirror holder; and

(c) means for adjusting said mirror holder;

said adjusting means comprising first and second actuating rods axially movably mounted in said casing, and a pair of motors disposed in said casing and operatively cooperating with said actuating rods so as to move said actuating rods, respectively, through coupling means;

said actuating rods having front ends adapted to be pivotally coupled to said mirror holder, and are spaced substantially right-angularly from each other around a center of said support structure; and

one of said motor being disposed in an area defined between a side of a plane extending through the center of said support structure and a central axis of said first actuating rod and facing said second actuating rod, and a side of a plane extending through the center of said support structure and a central axis of said second actuating rod and facing said first actuating rod, said one of said motors having a shaft, an extension of a central axis of said shaft substantially passing through said support structure.

4,693,572

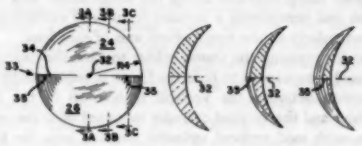
MONOCENTRIC BIFOCAL CORNEAL CONTACT LENS

George F. Tsuetaki, and Shiro Sato, both of Chicago, Ill., assignors to Fused Kontacts of Chicago, Inc., Chicago, Ill.

Filed Jun. 3, 1985, Ser. No. 740,407

Int. Cl.[4] G02C *7/04, 7/06*

U.S. Cl. 351—161 **8 Claims**



1. A bifocal contact lens blank having a front surface portion which is subdivided into distant and near vision front surface segments, said distant vision segment surface being defined, at least in part, by a front surface portion in the form of a segment of a sphere having a first, given radius of curvature, said near vision segment surface being defined at least in part by a front surface portion in the form of a segment of a sphere having a second, given radius of curvature which is smaller than the said first given radius of curvature, said distant vision segment lying in approximately the upper half of said lens blank and said near vision segment lying in the lower half of said lens blank, said surfaces meeting each other along a locus of tangent points lying generally centrally of the lens and being joined to each other on either side of said locus of tangent points by a pair of offsetting front surfaces extending between the lowermost edges of said distant vision segment surface and the uppermost edges of said near vision segment, said offsetting surfaces extending generally perpendicular to at least one of said near and distant vision front surfaces of said lens, and substantially along a meridian of said lens front surface, said offsetting surfaces, being adopted, in use, to face toward the lower lid of the wearer.

4,693,573

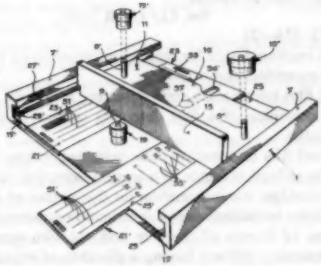
UNIVERSAL FRAME CENTERING, HOLDING AND MEASURING DEVICE

Georges Zoueki, 4812 Verdun, Verdun, Quebec, Canada H4G 1N1

Filed Mar. 10, 1986, Ser. No. 838,111

Int. Cl.[4] A61B *3/10*

U.S. Cl. 351—204 **14 Claims**



1. An universal frame centering, holding and measuring device for use by an optician to transcribe and check a distance interpupillary distance (distance P.D.), a reading interpupillary distance (reading P.D.), a segment height measured onto a customer, directly and precisely on a set of lenses mounted on a frame, said device comprising:

a base having a longitudinal axis, on which said frame may be positioned in flat position;

a central pin vertically projecting from the base;

at least one vertical cylinder mounted onto the central pin, said vertical cylinder having such a diameter as to fit within the bridge of the frame positioned onto the base;

a frame holder slidably mounted onto the base, said frame holder being movable along the longitudinal axis of the base and comprising a vertical front wall extending perpendicularly to the longitudinal axis of said base;

means for pressing the frame holder toward the central pin in such a manner as to hold the frame in substantially rigid position between the vertical front wall of the frame holder and the vertical cylinder mounted onto the central pin, with said vertical cylinder inserted into the bridge portion of the frame;

a pair of rulers slidably mounted on the base, said rulers extending parallel to the longitudinal axis of said base and being symmetrically positioned with respect to the central pin in such a manner as to extend under the two lenses mounted on the frame held by the frame holder, respectively;

a set of vertical graduations provided on each ruler, each vertical graduation indicating the distance separating it from the central pin and being useful for transcribing onto the lenses and checking the distance P.D. or reading P.D. of the customer; and

a set of horizontal graduations provided on each ruler, said horizontal graduations being useful for transcribing on the lenses the segment heights or progressive horizontal cross line of said customer.

4,693,574

FILM INFORMATION READING DEVICE

Ichiro Ohnuki, Tokyo; Yoshihiko Aihara, Kanagawa; Yoichi Tosaka, and Masaharu Eguchi, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1985, Ser. No. 757,136

Claims priority, application Japan, Jul. 27, 1984, 59-156552; Jul. 27, 1984, 59-156555

Int. Cl.[4] G03B *7/24*

U.S. Cl. 354—21 **28 Claims**

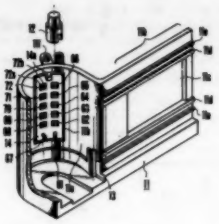
1. A reading device for reading information on the surface of a film cartridge, comprising:

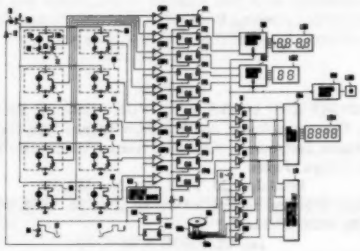
first film information code detecting means for determining a condition of a first detecting surface of the film cartridge;

second film information code detecting means for detecting the reflection factor of a second detecting surface of said cartridge, the information on the surface of the film cartridge including at least information concerning the number of frames of the film and the film sensitivity, said detecting surfaces having a plurality of trains of information codes, and said information codes being formed in plurality trains of patterns in the axial direction of the cartridge,

the second film information code detecting means being arranged in a plurality of trains corresponding to the plurality of trains of information codes; and

said first detecting means including detection contact pins which are arranged to come into contact with said first detecting surface of the film cartridge, said contact pins contacting an area about two times the information code





area of said second detecting surface, and detecting conductivity and con-conductivity between the contact pins.

4,693,575

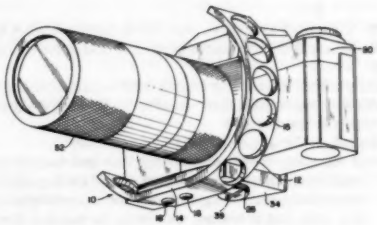
CAMERA SUPPORT

James H. Keller, 254 Knoll Dr., Park Ridge, N.J. 07656

Filed Apr. 22, 1986, Ser. No. 855,175

Int. Cl.[4] G03B *17/56*

U.S. Cl. 354—82 **7 Claims**



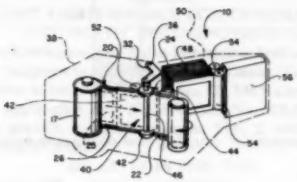
1. A portable camera support comprising, in combination: a generally arcuate member shaped to extend below and along at least one side of the lens barrel of the camera and having a portion for reception by the palm of a user, an adjustable assembly comprising a bracket secured to the arcuate member; and an adjustable clamp for connection to said bracket and for engagement with the camera; and means for securing said bracket to said camera; and wherein the spacing between said member and lens barrel is sufficiently small as th allow the fingers of a user of said support to manipulate the lens barrel while the the palm of the hand rests on any externally facing portion of the arcuate member.

4,693,576

CAMERA FOR PRODUCING FULLY MOUNTED TRANSPARENCIES

Richard J. Chen, Winchester, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 29, 1986, Ser. No. 947,358
Int. Cl.[4] G03B 17/50
U.S. Cl. 354—86 16 Claims



1. A photographic apparatus for a self-developing or instant type medium for recording an image upon exposure to light, said apparatus comprising:

means for developing an exposed image recording medium in said photographic apparatus;

means for retaining an exposed and undeveloped image recording medium in said photographic apparatus; and

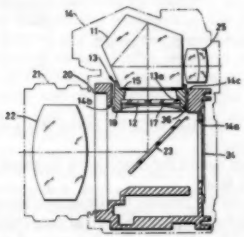
selectable directing means for selectively directing a recorded image medium exposure to said developing means for immediate processing of its latent image or to said retention means for subsequent processing exteriorly of said apparatus.

4,693,577

FOCUSING SCREEN MOUNTING DEVICE IN A CAMERA

Nobuaki Sasagaki, Kawasaki, and Hidekatsu Fujii, Yokohama, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Feb. 21, 1986, Ser. No. 831,633
Claims priority, application Japan, Feb. 28, 1985, 60-28396[U]
Int. Cl.[4] G03B 13/00, 19/12
U.S. Cl. 354—155 8 Claims



1. A single lens reflex camera in which a movable mirror for reflecting a light beam from a photo-taking lens toward a finder optical system having a penta roof prism is provided between the photo-taking lens and a focal plane, said camera comprising:

a housing structure having between said movable mirror and said finder optical system an opening for forming the optical path of the light beam from said photo-taking lens travelling from said movable mirror toward said finder optical system;

a focusing screen member disposed between said movable mirror and said penta roof prism to enable the image of an object to be photographed formed by said photo-taking lens to be observed and having a lower surface adjacent to said movable mirror and an upper surface adjacent to said penta roof prism;

a substantially rectangular frame member provided in said opening of said housing structure for supporting the periphery of said upper surface of said focusing screen member, said rectangular frame member including means for positioning said focusing screen member in said opening; and

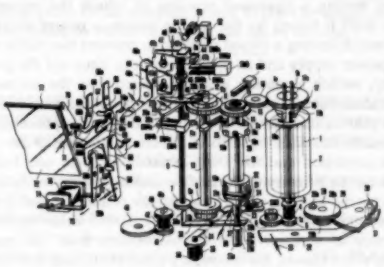
a resilient single wire member having, near a pair of opposed edges of said focusing screen member, first and second side portions contacting said lower surface of said focusing screen member, a third side portion linking one end of said first side portion and one end of said second side portion, a fourth side portion extending from the other end of said first side portion along a line parallel to said third side portion, and a fifth side portion extending from the other end of said second side portion along said line, said third side portion being releasably coupled to said rectangular frame member and said fourth and fifth side portions being rotatably supported on said rectangular frame member.

4,693,578

MOTORIZED WINDING AND REWINDING CAMERA

Tatsuo Konno, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 576,857, Feb. 3, 1984, abandoned. This application Mar. 12, 1986, Ser. No. 839,468
Claims priority, application Japan, Feb. 5, 1983, 58-17766
Int. Cl.[4] G03B 1/18
U.S. Cl. 354—173.1 10 Claims



1. A motirized winding and rewinding camera comprising:

(a) winding means having a driving torque transmission for winding a film;

(b) rewinding means having a driving torque transmission for rewinding the film;

(c) an electric motor operating as a torque source for said winding means and said rewinding means;

(d) a changeover member for selectively connecting the output of said motor to the driving torque transmission of said winding means or said rewinding means;

(e) a lock member for locking said changeover member in the winding position;

(f) a first rewind control actuating member for operating said lock member to release;

(g) a second rewind control actuating member for operating said changeover member to change over;

(h) detecting means for detecting when film rewinding by said rewinding means is completed;

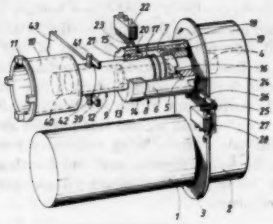
(i) controlling means responsive to the output of said detecting means which represents the fact that the film rewinding has been completed for changing over the driving torque transmission to the film winding state; and

(j) lock returning means for performing a locking operation on said changeover member by said lock member as said resetting means operates.

4,693,579
ARRANGEMENT FOR WINDING CAMERAS

Alf I. Alfredsson, Sävedalen, and Kjell A. Persson, Skene, both of Sweden, assignors to Victor Hasselblad AB, Gothenburg, Sweden

Filed Oct. 4, 1985, Ser. No. 784,554
Claims priority, application Sweden, Oct. 8, 1984, 8405019
Int. Cl.[4] G03B *1/12*
U.S. Cl. 354—173.1 **3 Claims**



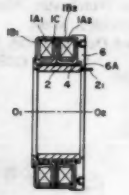
1. A winding device for tensioning a camera, said camera having a winding shaft and a locking device for arresting the shaft when a tensioning motion of the same is finished until an exposure sequence of the camera is completed said winding device comprising an electric motor, a transmission device comprising a primary driving shaft in driving connection with the motor, a secondary drive shaft in driving connection with said winding shaft of the camera, a spung means connecting the primary drive shaft and the secondary drive shaft, said sprung means having a tightened position in which the secondary drive shaft is biased by the sprung means, a power supply, a first switch having a closed position to connect the motor with said power supply and an open position to interrupt the power supply, switch actuating means connected to the secondary drive shaft for opening the first switch when the secondary drive shaft is in a certain angular position corresponding to a position of the winding shaft of the camera in which the camera is tensioned and the shaft arrested, at least one locking notch on the primary drive shaft, a locking means for interacting with the locking notch to arrest the primary drive shaft in at least one certain angular position against motion under the influence of a reactive turning movement from the sprung means when biasing the secondary drive shaft, and said sprung means being dimensioned to store energy sufficient for the tensioning of the winding shaft of the camera with a sufficient turning movement when the secondary drive shaft is in its certain angular position and the primary drive shaft is in its certain angular position with the sprung means being tightened, so that the sprung means by releasing the winding shaft by means of the locking device tensions the camera by rotating the secondary drive shaft bringing it out of its certain angular position, thereby closing the first switch and actuating the motor to tighten the sprung means once again.

4,693,580
MOTOR

Ryoichi Hanamori, Yokohama; Shigeo Nakashima, Kawasaki, and Hiroshi Yamamoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha and Canon Seiki Kabushiki Kaisha, both of Tokyo, Japan

Filed Dec. 31, 1985, Ser. No. 815,010
Int. Cl.[4] G03B *9/06*; H02K *5/10*; E01D *19/06*
U.S. Cl. 354—271.1 **7 Claims**

1. A diaphragm mechanism of a camera comprising:
a ring-shaped stator having an excitation coil;
a ring-shaped magnet rotor arranged inside of said stator;
a ring-shaped lubrication member made of a resin material interposed between said stator and said rotor to serve as a lubrication member;
a ring-shaped hold member for holding said stator, said rotor and said lubrication member in union;
diaphragm means; and

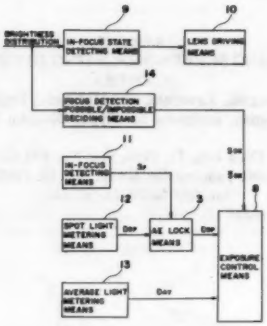


coupling means for coupling said diaphragm means to said rotor.

4,693,581
CAMERA WITH AN AUTOMATIC FOCUS ADJUSTING APPARATUS

Toshio Yamaki, Osaka; Hiromu Mukai, Kawachinagano; Akihiko Fujino; Shuji Izumi, both of Sakai; Masaaki Nakai, Kawachinagano, and Nobuyuki Taniguchi, Nishinomiya, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 29, 1986, Ser. No. 901,652
Claims priority, application Japan, Sep. 2, 1985, 60-134687[U]; Sep. 4, 1985, 60-135373[U]
Int. Cl.[4] G03B *3/00, 7/091*
U.S. Cl. 354—400 **2 Claims**



1. A camera provided with an automatic focus adjusting apparatus comprising:
a first detection means for detecting a focusing condition of an objective lens;
a focusing means for driving the objective lens according to the detected focusing condition and outputting an in-focus signal when the objective lens has moved to the in-focus position;
a second detection means for detecting whether or not it is possible for the detection means to detect the focusing condition;
a first light metering means for metering the brightness of a portion of an object according to the detection region of the detecting means and outputting a first light metering signal according to the metered result;
a second light metering means for metering an average brightness corresponding to an entire object to be photographed outputting a second light metering signal in accordance with the metered result;
a lock means for locking the first light metering signal when the in-focus signal is outputted; and
a means for controlling exposure amount according to the

first light metering signal locked by the lock means when it is detected by the second detection means that a detection of the focusing condition is possible and controlling exposure amount in response to the second light metering signal when it is detected by the second detection means that a detection of the focusing condition is impossible.

4,693,582

AUXILIARY LIGHT SOURCE FOR CAMERA HAVING AUTOMATIC FOCUSING DEVICE

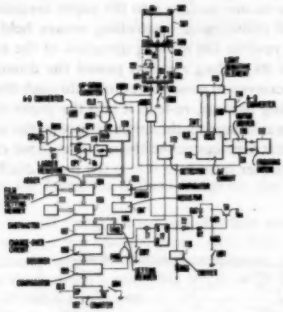
Masaharu Kawamura, and Akira Hiramatsu, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 459,674, Jan. 20, 1983, abandoned. This application Apr. 29, 1986, Ser. No. 858,544

Claims priority, application Japan, Feb. 2, 1982, 57-15143; Feb. 2, 1982, 57-15148

Int. Cl.[4] G03B *3/00, 7/00*

U.S. Cl. 354—403 **34 Claims**



1. A lighting device to be used in combination with a camera having an automatic focusing device for adjusting the focus on an object to be photographed, said automatic focusing device working prior to an exposure control operation of the camera, and said lighting device comprising:

(a) a mount part which is attachable to a shoe part of said camera, wherein said shoe part of the camera is provided at a position above a pentagonal part of the camera and said mount part has a signal terminal which can be connected to a signal pin provided at the shoe part of the camera, further said signal pin is connected to a starting signal forming circuit which produces a starting signal prior to the exposure control operation of the camera; and

(b) an emitting source for projecting light to an object in response to said starting signal received through said signal pin and said signal terminal; and

wherein said automatic focusing device is of the accumulation type in which the operation of accumulating image signals is recycled, and said starting signal forming circuit produces said starting signal in such a way as to be in synchronism with the accumulating operation so that light is emitted from said emitting source at least during the image signal accumulating operation of said focusing device.

4,693,583

PROGRAMMABLE SHUTTER

Masuo Ogihara; Hajime Oda; Yoichi Seki, and Hiroshi Yamazaki, all of Yotsukaido, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

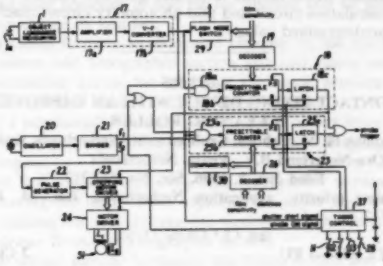
Filed Aug. 15, 1985, Ser. No. 766,032

Claims priority, application Japan, Aug. 15, 1984, 59-170277

Int. Cl.[4] G03B *7/097*

U.S. Cl. 354—439 **10 Claims**

1. A programmable shutter comprising: a shutter mechanism including a set of sectors defining an aperture for a lens and a stepping motor rotatable in forward and reverse directions in response to forward and reverse driving pulses applied thereto for opening and closing the set of sectors; and a control section including object liminance measuring means for outputting a signal corresponding to the luminance of an object, circuit means responsive to the signal output by the object luminance measuring means for outputting a control signal after the lapse of a time which is in reverse proportion to the luminance of the object, means for generating a series of reference pulse signals



of constant frequency, and stepping motor driver means for outputting driving pulses of constant frequency to the stepping motor in synchronism with said series of reference pulse signals and operative to apply forward driving pulses to effect opening of the set of sectors and operative in coincidence with the control signal from said circuit means to forcibly reverse the phase of the driving pulses even during the application of a driving pulse to the stepping motor to thereby apply reverse driving pulses to effect closing of the set of sectors.

4,693,584

DIAPHRAGM CONTROLLER FOR CAMERAS IN WHICH THE DIAPHRAGM OPENING IS SELECTED IN ACCORDANCE WITH A PREPROGRAMMED CHARACTERISTIC

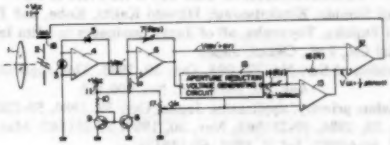
Tetsuo Miyasaka, Hachioji, Japan, assignor to Olympus Optical Co., Ltd, Tokyo, Japan

Continuation of Ser. No. 588,348, Mar. 12, 1984, abandoned. This application Jun. 19, 1986, Ser. No. 877,092

Claims priority, application Japan, May 12, 1983, 58-83682

Int. Cl.[4] G03B *7/08*

U.S. Cl. 354—446 **14 Claims**



1. A diaphragm controller of a camera of the program type, comprising:

diaphragm driving means for gradually reducing a diaphragm from its maximum to its minimum aperture;

a photometry circuit including a photoelectric transducer element which receives light from an object being photographed passing through a taking leans and the diaphragm for producing an output corresponding to a photoelectric variation of said transducer element as the diaphragm aperture is reduced;

a reduced number of steps of diaphragm detecting means responsive to the photometry circuit output for generating a signal proporational to a reduced number of steps of diaphragm while the diaphragm aperture is reduced by

said diaphragm driving means based on an output of said photometry circuit, said detecting means producing said signal by inverting the output of said photometry circuit;

a calculation circuit for altering the output of said reduced number of steps of diaphragm detecting means by multiplying said signal by a factor which satisfies a predetermined program characteristic; and

a comparison circuit for producing a stop signal to stop an aperture reducing operation of said diaphragm driving means whenever the difference between outputs of said calculation circuit and said photometry circuit reaches a predetermined value.

4,693,585

CONTACT FIXING DEVICE WITH AN IMPROVED CLEANING ROLLER

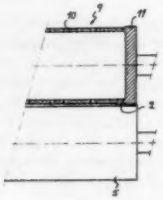
Wilhelmus H. M. Orbons, Grubbenvorst, Netherlands, assignor to Oce-Nederland B.V., Venlo, Netherlands

Filed Jun. 9, 1986, Ser. No. 872,217

Claims priority, application Netherlands, Jun. 14, 1985, 8501717

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 FU **3 Claims**



1. A contact fixing device comprising a fixing surface made from a somewhat resilient material, a means for driving the fixing surface, a means for heating the fixing surface, a pressure surface which presses against the fixing surface forming a fixing zone through which copy material can be fed for fixing a toner image thereon, a means for driving the pressure surface and a hollow perforated cleaning roller which while rotating in contact with the fixing surface takes up toner from the fixing surface and has a narrow circular thickening near each end.

4,693,586

ELECTROSTATIC COPYING APPARATUS

Yasuji Sumida, Kitakatsuragi; Hiroshi Kajita, Kobe, and Tadashi Fujioka, Toyonaka, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

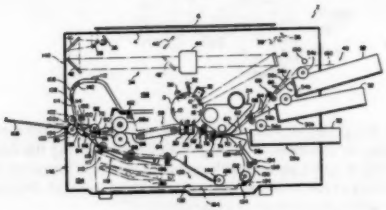
Division of Ser. No. 793,094, Oct. 30, 1985. This application Aug. 20, 1986, Ser. No. 900,163

Claims priority, application Japan, Oct. 30, 1984, 59-226719; Nov. 30, 1984, 59-251565; Nov. 30, 1984, 59-251567; Mar. 30, 1985, 60-64982; Jul. 9, 1985, 60-149176

Int. Cl.[4] G03G *15/00*; B65H *29/58*

U.S. Cl. 355—3 SH **26 Claims**

1. An electrostatic copying apparatus of the type comprising a copying paper conveying passage, a copying paper feeding means for feeding a copying paper sheet to the paper conveying passage, a conveyance controlling means disposed adjacent to the downstream end of the paper conveying passage, said conveyance controlling means having upstream and downstream ends, a copying paper discharging passage extending from its upstream end adjacent to the downstream end of the conveyance controlling means, a copying paper reversing passage extending from its upstream end adjacent to the downstream end of the conveyance controlling means, and a copying paper returning passage extending from its upstream end adjacent to the upstream end of the conveyance controlling means and located beneath the downstream end of the paper conveying passage, said conveyance controlling means being adapted to be held selectively at a first position at which it permits communication between the downstream end of the paper conveying passage and the upstream end of the paper discharging passage and the upstream end of the paper discharging passage and a second position at which it permits communication between the downstream end of the paper conveying passage and the upstream end of the paper reversing passage and also communication between the upstream end of the paper reversing passage and the upstream end of the paper returning passage, and of the type being adapted to form an image on one surface of a copying paper sheet while it is conveyed through the paper conveying after being fed thereto from the paper feeding means, introduce the copying paper sheet bearing an image on one surface into the paper discharging passage through the conveyance controlling means held at the first position and thereafter discharge it through the paper discharging passage, or to introduce the copying paper sheet bearing an image on one surface into the paper reversing passage through the conveyance controlling means held at the second position, reverse the moving direction of the copying paper sheet after its trailing end has passed the downstream end of the paper conveyed passage, return it through the copying paper returning passage, re-feed it into the paper conveying passage, form an image on the other surface of the copying paper sheet while it is re-conveyed through the paper conveying passage, thereafter introduce it into the paper discharging



passage through the conveyance controlling means held at the first position and then discharge it through the paper discharging passage; wherein

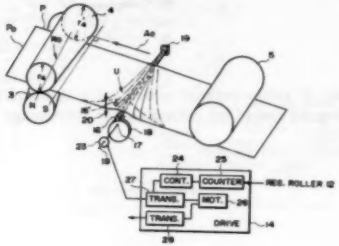
said apparatus further comprises a multifunctional conveying means for carrying the copying paper sheet from the downstream end of the paper conveying passage and delivering the copying paper to the paper returning passage from the upstream end of the paper returning passage, and

the multifunctional conveying means includes a lower supporting shaft and an upper supporting shaft vertically spaced from each other, a first conveying roller mounted on the lower supporting shaft, a second conveying roller mounted on the upper supporting shaft and delivering the copying paper from the downstream end of the paper conveying passage in cooperation with the first conveying roller, one end portion of the first conveying roller projecting beyond one end of the second conveying roller to an extend within the width of the copying paper passing between the conveying rollers, and a carrying means located below the first conveying roller for carrying the copying paper into the paper returning passage from the upstream end of the paper returning passage, and a forcing means for forcing downwardly the trailing end portion of the copying paper which has passed the nipping site between the first conveying roller and the second conveying roller, the forcing means comprising a protrusion formed in said one end portion of the first conveying roller.

4,693,587
IMAGE FORMING APPARATUS

Michio Shigenobu, Tokyo, and Takashi Saito, Ichikawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 11, 1985, Ser. No. 753,872
Claims priority, application Japan, Jul. 16, 1984, 59/147099; Oct. 22, 1984, 59/221455
Int. Cl.[4] G03G *15/20, 21/00*
U.S. Cl. 355—3 FU **23 Claims**

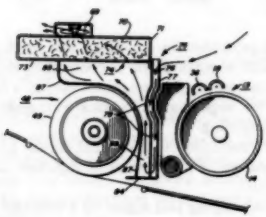


1. An image forming apparatus, comprising:
means for forming an unfixed image on a recording material; and
means for fixing the unfixed image on the recording material;
wherein said fixing means includes first and second rollers forming a nip therebetween, said first roller having a diameter which is relatively smaller at one longitudinal end thereof and is relatively larger at the opposite longitudinal end thereof, and
wherein the distance between an image forming position of said image forming means and said nip formed between said first and second roller, measured along a path of the recording material, is shorter than a length of the recording material measured along the path, and
wherein said first and second rollers receive a leading edge of the recording material at the nip in such a manner that the leading edge is non-parallel to the nip and said first and second rollers change a direction of movement of the recording material by the difference in peripheral speed provided by the difference in the diameter of said first roller.

4,693,588
THERMAL AIR CURTAIN FOR A COPYING/PRINTING MACHINE

Joseph A. Yarbrough, Rochester; David O. Kingsland, Fairport, and Donald L. Pease, Hanceoye, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 9, 1986, Ser. No. 853,819
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 R **2 Claims**

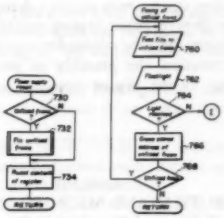


1. In a copying/printing machine having a xerographic section including a photoreceptor on which latent electrostatic images are formed and developed, and thereafter transferred to a copy substrate material, and a fusing section where the developed image transferred to the copy substrate material is fixed by heat, the xerographic section and the fusing section being disposed in close adjoining relation to one another to provide maximum machine compactness, the combination of:
(a) an exhaust fan for generating a flow of air internally of said machine, said fan discharging air outside said fusing section;
(b) a filter upstream of said fan for filtering said air prior to discharge by said fan;
(c) means forming an elongated chamber in the space between said xerographic section and said fusing section extending across the width of the space between said xerographic section and said fusing section;
(d) a substantially vertical wall in said chamber separating said chamber into first and second back to back air passages;
said first passage bordering said xerographic section and having air inlet means adjacent the upper end thereof opening into said xerographic section through which air is drawn from said xerographic section;
said second passage bordering said fusing section and being closed to said fusing section, said second passage having air outlet means adjacent the upper end thereof communicating with said filter through which air is discharged to said filter for discharge by said fan;
said wall having aperture means adjacent the bottom thereof connecting said first passage with said second passage, so that air drawn from said xerographic section is forced to follow a generally U-shaped path from said air inlet means downwardly through said first passage, through said aperture means to said second passage, and upwardly through said second passage to said outlet means whereby there is provided a pair of back to back curtains of moving air flowing in opposite directions to one another between said xerographic and fuser section, said pair of air curtains cooperating to inhibit transfer of heat from said fusing section to said xerographic section.

4,693,589
METHOD OF AND APPARATUS FOR FIXING UNFIXED FRAME

Izumi Watanabe, and Yu Tojo, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 3, 1986, Ser. No. 937,635
Claims priority, application Japan, Dec. 4, 1985, 60-273011
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—5 **18 Claims**



1. An unfixed frame fixing method comprising the steps of:
making a judgement as to whether or not fixing of a frame image to a recording film has been effected;
storing, when it is judged that said fixing has not been effected accidentally, the address of the unfixed frame in a data storing medium;
reading the address of said unfixed frame from said data storing medium when processing is resumed and effecting fixing of said unfixed frame; and
erasing the address of said unfixed frame from said data storing medium after completion of the fixing operation.

4,693,590

ELECTRONIC COPIER WITH AUTOMATIC DOCUMENT FEEDER AND SORTER

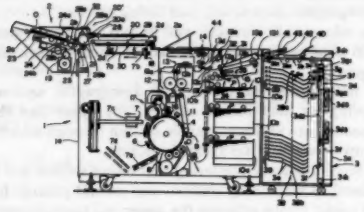
Shin Umeda, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 15, 1985, Ser. No. 765,821

Claims priority, application Japan, Aug. 20, 1984, 59-172615; Aug. 31, 1984, 59-182317; Sep. 1, 1984, 59-183516; Sep. 1, 1984, 59-183518; Sep. 2, 1984, 59-183158; Sep. 2, 1984, 59-183161; Sep. 3, 1984, 59-185214

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 SH 11 Claims



1. An electronic copier equipped with an automatic document feeder and a sorter, comprising:

multi-job mode setting means for selectively activating a multi-job mode command in which a plurality of groups of documents which differ in copying conditions from each other are copied without operator intervention;

copying condition inputting means for inputting, before the copying of any document of any group, copying conditions respectively associated with each of the plurality of groups of documents;

an executed document couter for counting documents which have been copied;

an executed copy counter for counting papers, or copies, which are discharged after copying;

job data store means for storing all of the copying conditions entered in advance through the copying condition inputting means, a count of the executed document counter, and a count of the executed copy counter;

division paper sensing means for sensing a division paper which is interposed between the documents whereby to divide the documents by group; and

copy control means responsive to the state of the multi-job mode setting means, to job data for all the jobs as stored in the job data store means and to a detection signal applied from the division paper sensing means, said copy control means controlling the copier for copying, without operator intervention, the plurality of groups of documents according to the pre-set copying conditions for each group.

4,693,591

MICROFILM AND MICROFILM PRINTER

Takao Saijo, Tokyo, and Masafumi Fujita, Kanagawa, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

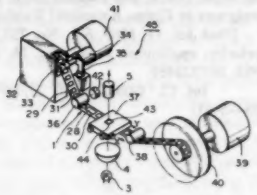
Filed Jul. 30, 1986, Ser. No. 890,479

Claims priority, application Japan, Aug. 5, 1985, 60-172099; Aug. 31, 1985, 60-192901

Int. Cl.[4] G03B *27/52*

U.S. Cl. 355—41 8 Claims

1. A microfilm comprising: a film base; a plurality of microimages defining film frames continuously formed on the film base; the microimages comprising at least two different sizes; the microimages being provided at peripheries thereof on the film base with size indicating means which comprises at least two different marks or a combination of no mark and at least



one kind of mark, each of which has a distinctiveness for indicating the size of the corresponding microimage.

4,693,592

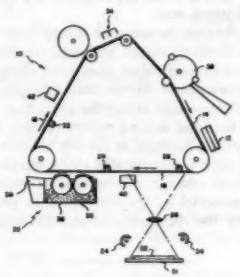
PATCH GENERATOR FOR AN ELECTROPHOTOGRAPHIC DEVICE

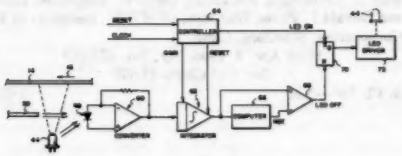
Vincent E. Kurpan, Milford, N.H., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 27, 1986, Ser. No. 867,166

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—14 E 6 Claims





1. A patch generator for creating a test patch on a charged photoconductor member useful in controlling process parameters in electrophotographic machines having a main illumination source for exposing an original document; said patch generator comprising:

means for producing an electrical signal having a value representative of the amount of exposure of the original document;

means for modifying said signal by a selectable factor; and

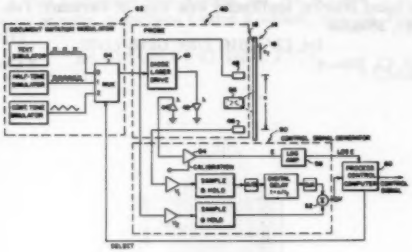
means, responsive to said modified signal, for producing a test patch exposure on the photoconductive member, said test patch exposure having an exposure value determined by the value of said modified signal.

4,693,593

ELECTROGRAPHIC PROCESS CONTROL

Scott A. Gerger, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 24, 1986, Ser. No. 877,948
Int. Cl.[4] G03G *15/052*
U.S. Cl. 355—14 CH 5 Claims



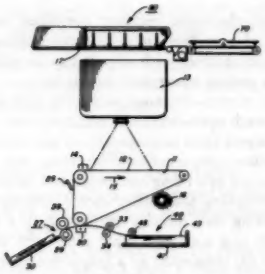
1. In an electrographic device that uses a chargeable image transfer member with at least one image area and has means for adjusting at least one process parameter in response to changes in the sensitometric characteristics of the image transfer member as measured in a portion of the image transfer member outside of the image area; the improvement comprising transfer member discharging means for subjecting said portion of the transfer member to a history of being charged and discharged substantially the same as the history of the image area of the transfer member.

4,693,594

PLATEN TRANSPORT AND VACUUM PLENUM FOR BOOK COPYING

Gerald M. Garavuso, Macedon, N.Y., and Troy Shinbrat, Greenbelt, Md., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 20, 1985, Ser. No. 811,195
Int. Cl.[4] G03B *27/32, 27/52*
U.S. Cl. 355—25 24 Claims



1. A method for copying pages from a facedown book, comprising the steps of:

(a) providing a platen surface for copying pages from the facedown book and a support member in the same plane as said platen surface for supporting the facedown book during forward and backward transport;

(b) providing belt means entrained around said support member for driving the book toward and away from said platen surface;

(c) providing a vacuum plenum positioned between and in the same plane as said platen surface and said support member, said vacuum plenum being adapted to peel a page from a first half of the facedown book as the book is transported past the vacuum plenum by said belt means;

(d) positioning a page flipping assist means immediately adjacent said vacuum plenum for contacting the page peeled from the book by said vacuum plenum and flattening the page against a second half of the facedown book;

(e) providing roller means adjacent to and downstream of said page flipping assist means for engaging the lead edge of the bottommost page of the first half of the book after the lead edge has passed the roller means by a sufficient distance, said roller means being adapted to reduce friction between the pages of the book and said platen surface; and

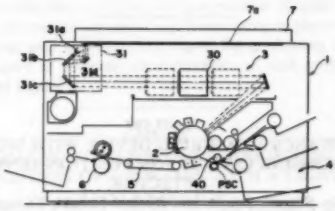
(f) providing a transport means for receiving the book from said belt means and transporting the book into position for copying.

4,693,595

METHOD OF CONTROLLING A STOP POSITION OF AN OPTICAL SYSTEM IN A COPYING MACHINE

Norihide Kunikawa, Yao; Tetsuya Kondo, Shizuoka; Yasumasa Ohba, Numazu, and Michihiro Matsuoka, Susono, all of Japan, assignors to Sharp Kabushiki, Osaka, Japan

Filed Aug. 29, 1985, Ser. No. 770,585
Claims priority, application Japan, Aug. 30, 1984, 59-183179; Aug. 30, 1984, 59-183180; Aug. 30, 1984, 59-183181; Aug. 30, 1984, 59-183182; Sep. 5, 1984, 59-186209
Int. Cl.[4] G03B *27/32*
U.S. Cl. 355—77 6 Claims



1. A method of controlling return speed of an optical system in a copying machine, said optical system being moved by a motor in a feed direction with a predetermined feed speed and a return direction for returning to a predetermined home position, said method comprising

returning the optical system with a first speed higher than the feed speed,

decelerating the return speed from the first speed to a second speed which is lower than the first speed to permit countercurrent braking to the motor without control disturbance,

performing a countercurrent braking of the motor after the return speed is decelerated to or lower than the second speed, and

controlling the speed of the motor after the countercurrent braking process is performed such that the optical system can be stopped at the home position.

4,693,596

METHOD OF DETERMINING EXPOSURES

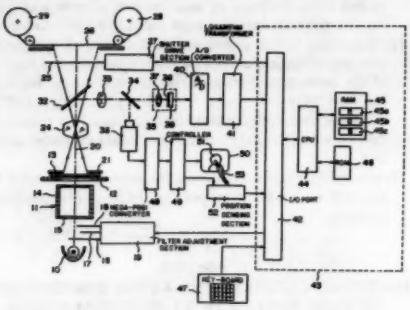
Takao Shigaki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 30, 1986, Ser. No. 857,627
Claims priority, application Japan, Feb. 12, 1986, 61-28554
Int. Cl.[4] G03B *27/32*
U.S. Cl. 355—77 11 Claims

1. A method of determining exposures when printing on a medium from an original, which comprises:

determining two image extents comprising a principal sub-

ject and a background on said original by selectively separating the original into a principal subject area and a background area;



obtaining at least one image characteristic value for each said image extent by measuring the density value of each of a plurality of points on said original; and

calculating the exposure based on said image characteristic values.

4,693,597

DISTANCE MEASURING DEVICE WITH SIGNAL PROCESSING CIRCUIT FOR POSITION SENSITIVE DETECTOR

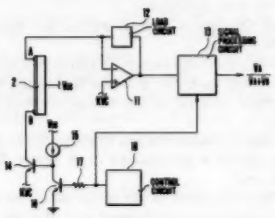
Yasuhiko Shiomi, Tokyo, and Ryoichi Suzuki, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Feb. 27, 1984, Ser. No. 583,755

Claims priority, application Japan, Mar. 2, 1983, 58-34291

Int. Cl.[4] G01C *3/24;* G01J *1/20*

U.S. Cl. 356—1 **12 Claims**



6. A signal processing circuit for light receiving means producing two output currents which oppositely vary as the position of light incident thereon varies, said signal processing circuit comprising:

(a) a signal processing circuit at a first terminal of said light receiving means;

(b) a control circuit at a second terminal of said light receiving means and including an openable switching element in series with said second terminal and capable of bring said second terminal into an open state; and

(c) control means for controlling said switching element to open said switching element.

4,693,598

OPTO-ELECTRONIC MEASURING RECEIVER AND METHOD FOR CONTROLLING THE OPTO-ELECTRONIC MEASURING RECEIVER

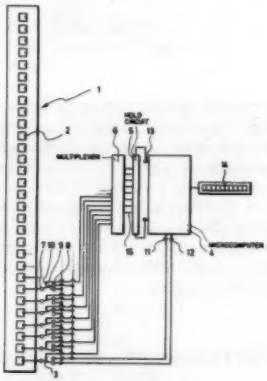
Willibald Sehr, Waldbrunn-Ellar, Fed. Rep. of Germany, assignor to MOBA-Electronic Gesellschaft fur Mobil-Automation mbH, Hadamar, Fed. Rep. of Germany

Filed Feb. 7, 1986, Ser. No. 827,166

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 3506304

Int. Cl.[4] G01C *3/08;* G01B *11/00*

U.S. Cl. 356—4 **8 Claims**



1. An opto-electronic receiver combined with switching assemblies and a control circuit for determining the relative position of the receiver with respect to a radiation plane produced by an optical transmitter, comprising:

a plurality of opto-electronic receiving units (2) disposed in a row, each opto-electronic receiving unit generating an output signal upon impingement of said radiation plane on a respective opto-electronic receiving unit;

each receiving unit being connected to a respective terminal (7) of switching assemblies, each switching assembly further having two discrete outputs (8,9), a switching element (3) and a control input (10), with each switching element (3) connected to a respective terminal (7) to receive an output signal therefrom when generated, each switching element having its own control input (10) and switchable thereby to one or the other output (8,9) to deliver the output signal thereto;

a control circuit connected to said control inputs (10) of said switching assemblies for controlling the respective switching conditions thereof;

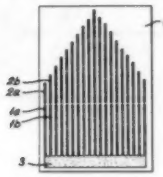
one output of each switching assembly being connected to a first input (11) of said control circuit, the other output of each switching assembly being connected to a second input (12) of said control circuit; and

said control circuit including memory means for storing data designating one receiving unit among said plurality of receiving units.

4,693,599
APPARATUS FOR MEASURING LIGHT BEAM CHARACTERISTICS

Walter Margulis, London; Wilson Sibbett, Hillingdon Heath, and William E. Sleat, Ickenham, all of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 554,392, Nov. 22, 1983, abandoned. This application Mar. 5, 1986, Ser. No. 837,644
Claims priority, application United Kingdom, Nov. 26, 1982, 8233812
Int. Cl.[4] G01J 1/42; H01L 27/14
U.S. Cl. 356—121 9 Claims



1. Apparatus for measuring a characteristic of a beam of light comprising:

a layer of photosensitive semiconductor or insulating material and a plurality of electrodes on the layer, the electrodes being positioned to define a linear array of gaps between pairs of electrodes, one electrode of each pair being connected to a common input terminal and the other electrode of a pair bein connected to an individual output terminal, the material in the gaps acting as an array of light detectors;

means for directing a beam, a characteristic of which is to be measured onto said array;

means for detecting changes in an electrical characteristic of each of said detectors caused by incidence of the light beam of the said array,

said detecting means comprising voltage bias means for applying a bias voltage to the common input terminal, individual resistors connected to the other electrode of each respective pair, individual pairs of back-to-back diodes connected to each resistor, a common voltage measuring means to which said pairs of diodes are connected so that the pairs of diodes block the voltages of the individual resistors from the voltage measuring means, and means for applying trigger pulses in sequence to each pair of diodes to enable any voltages across the resistors connected thereto to be measured in sequence; and

means for indicating such changes.

4,693,600
OPTICAL BEAM ANALYZER

Michael A. Cross, Severna Park, and Edward W. Nichols, Reisterstown, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 854,067, Apr. 17, 1986, abandoned, Continuation of Ser. No. 547,603, Nov. 1, 1983, abandoned. This application Oct. 23, 1986, Ser. No. 922,797
Int. Cl.[4] G01J 1/00
U.S. Cl. 356—121 5 Claims

1. A system for determining selected characteristics of a collimated optical signal directed along a predetermined optical path comprising:

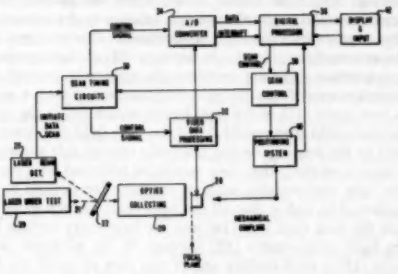
(a) means for sampling said collimated optical signal to generate a synchronizing signal;

(b) optical apparatus positioned in said predetermined optical path for focusing said collimated optical beam in a predetermined focal plane;

(c) a linear array of photodetectors;

(d) means for supporting said linear array of photodetectors in said predetermined focal plane including selective positioning means for moving or stepping the linear array in small precise increments in a direction perpendicular to the optical path to thereby mechanically step or scan the linear array over a predetermined area of the focal plane in response to said synchronizing signal;

(e) electronic scan means for collecting data from said linear array and operable at each stepped increment position of the linear array to scan the linear array at an initial predetermined fast scan rate at one end portion of the linear



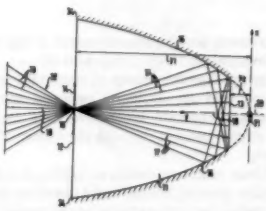
array, and at a predetermined slow scan rate over a central portion of the linear array, and at the predetermined fast scan rate over the other end portion of the linear array; and

(f) data collecting and processing apparatus coupled to receive the output signals of said linear array of photodetectors and said synchronizing signal for generating signals indicative of selected characteristics of said collimated optical signal.

4,693,601
LIGHT SCANNING DEVICE FOR DETERMINING THE CONDITION OF A SURFACE WITH A LIGHT CONCENTRATOR

Klaus Dabelstein, Pöcking/Starnberg, and Christian Skrobol, Inning, both of Fed. Rep. of Germany, assignors to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed May 8, 1986, Ser. No. 861,017
Claims priority, application Fed. Rep. of Germany, May 24, 1985, 3518832
Int. Cl.[4] G01N 21/89, 21/47
U.S. Cl. 356—237 14 Claims



1. A light scanning device for determining the condition of a surface comprising means for forming a scanning line on the surface of an article and an optical system for concentrating, at a point-like concentration zone, all the light beams which lie in a plane extending parallel to the scanning line and which leave the surface, depending on the surface condition, which in a specific direction corresponding to a normal reflection, or in a direction which deviates somewhat from this as a result of surface faults; wherein said point-like concentration zone is

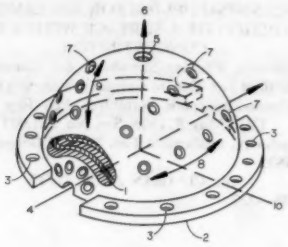
located, depending on whether the light beams have the normal direction or deviate in angle somewhat therefrom, either at a normal position on the light entry surface of a transparent light concentrator or displaced somewhat relative thereto in the direction of the light streak; wherein the light concentrator has outer mirrored side surfaces and tapers away from the concentration zone to a desired light exit surface where an areal photoconverter, in particular a photomultiplier is arranged; and wherein a dark field stop is arranged at the normal position for the light concentrator and preferably also in a small angular range about this normal position, said stop permitting only light beams which leave the surface above a predetermined angle of deviation relative to the normal direction to enter into the light concentrator, characterised in that the externally mirrored side surfaces (15) of the tapering light concentrator (11) are increasingly convexly curved in the direction away from the light entry surface in such a way that at least some (17) of the light beams which fall in the range of the dark field stop would fall, if the dark field stop were imagined to the missing, on the convexly curved side surfaces (15) at angles so steep that they would be reflected backwardly in the light concentrator without reaching the desired light exit surface (13); and in that all the light beams which enter alongside the dark field stop (14) into the light entry surface (12) of the light concentrator (11) impinge on the mirrored side surfaces (15) at such shallow angles that they all reach the desired light exit surface (13).

4,693,602

METHOD AND APPARATUS FOR MEASURING THE LIGHT SCATTERING PROPERTIES OF SMALL PARTICLES

Philip J. Wyatt, Santa Barbara, and Steven D. Phillips, Goleta, both of Calif., assignors to Wyatt Technology Corporation, Santa Barbara, Calif.

Filed Nov. 6, 1984, Ser. No. 668,711
Int. Cl.[4] G01N *15/02*
U.S. Cl. 356—336 **27 Claims**



1. An instrument for the measurement of the radiation scattered by individual particles comprised of:

(a) a scattering chamber means of essentially spherical shape containing two diametrically opposed apertures for the insertion and removal respectively, of the particle-containing stream passing through the center of said spherical chamber;

(b) an incident radiation means providing a collimated beam of radiation passing through said chamber and intersecting said particle-containing stream at the center of said spherical chamber;

(c) entrance and exit apertures for the passage of the radiation beam through the center of the said chamber means;

(d) a multiplicity of identical ports at a plurality of angular locations, each subtending a small solid angle with respect to the point of intersection of said aerosol stream and incident radiation beam at the center of said spherical chamber;

(e) a port subtending a solid angle at least **10** times larger than the solid angle subtended by the ports of (d) and located in the forward direction with respect to the direction of said incident radiation beam;

(f) a port of structure essentially identical to (e), but located in the backward direction;

(g) radiation collimation and collection means corresponding and attached to each of the small solid angle ports of (d);

(h) collimated optical fiber bundles means corresponding and attached to each large solid angle port of (e) and (f), respectively;

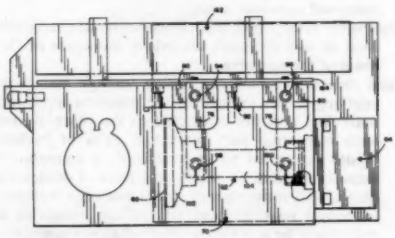
(i) individual detection means corresponding and attached to each collection means of (g) and (h) by which the scattered radiation collected thereby may be converted into an electrical signal.

4,693,603

RUGGEDIZED COMPACT INTERFEROMETER REQUIRING MINIMUM ISOLATION FROM MECHANICAL VIBRATIONS

Gerald L. Auth, Laguna Beach, Calif., assignor to MIDAC Corporation, Costa Mesa, Calif.

Filed Oct. 21, 1985, Ser. No. 789,849
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—346 **23 Claims**



1. An interferometer structure, for use in an environment in which it is subjected to ambient vibration comprising:

a movable member which provides a mirror at one end thereof, and which is so constructed as to have the highest practicable minimum mechanical resonant vibration frequency;

driving means which causes back and forth movement of the movable member, and which includes an operative interconnection with the movable member so constructed as to have the highest practicable minimum mechanical resonant vibration frequency;

supporting means for the movable member which constrains it to move along a predetermined path, and which includes an operative interconnection with the movable member so constructed as to have the highest practicable minimum mechanical resonant vibration frequency; and

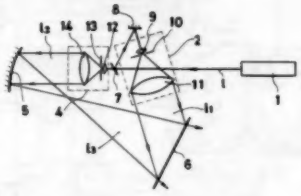
a mirror drive loop, for controlling the velocity of the movable member, which includes the above-recited mechanical elements, and also includes electronic components comprising sensing, feedback and control circuitry, whose maximum performance is limited by the minimum mechanical resonant vibration frequency in the mechanical elements of the mirror drive loop.

4,693,604

INTERFERENCE METHOD AND INTERFEROMETER FOR TESTING THE SURFACE PRECISION OF A PARABOLIC MIRROR

Koji Tenjinbayashi, Ibaraki, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Aug. 6, 1985, Ser. No. 762,944
Claims priority, application Japan, Aug. 6, 1984, 59-164661
Int. Cl.[4] G01B 9/021
U.S. Cl. 356—348 14 Claims



1. An interference method of testing the surface precision of a parabolic mirror, comprising the steps of:

dividing a beam of light rays from a laser light source into two beams of light by means of a beam splitter;

producing an illuminating light beam by converting one of said two beams of light into a divergent spherical light wave by means of a microscope object lens and an associated pinhole;

producing a reference light beam from the other one of said two light beams;

illuminating a parabolic mirror to be tested with said illuminating light beam;

causing reflected light from said parabolic mirror to interfere with said reference light beam so as to thereby form interference fringes; and

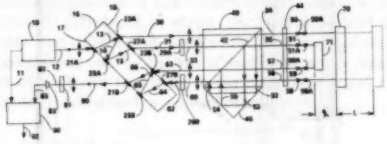
determining any shaping error of said parabolic mirror from said interference fringes.

4,693,605

DIFFERENTIAL PLANE MIRROR INTERFEROMETER

Gary E. Sommargren, Madison, Conn., assignor to Zygo Corporation, Middlefield, Conn.

Continuation-in-part of Ser. No. 810,999, Dec. 19, 1985. This application Jun. 12, 1986, Ser. No. 873,423
Int. Cl.[4] G01B 9/02
U.S. Cl. 356—349 33 Claims



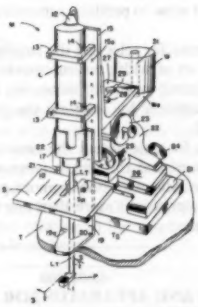
1. A differential plane mirror interferometric system comprising: a pair of plane mirrors separable by a variable optical path length; source means for emitting an input beam comprising two stabilized orthogonally polarized optical frequencies; tilted parallel plate means optically coupled to said input beam for converting said input beam into two separated parallel orthogonally polarized beams; means optically disposed in the path of one of said two separated parallel orthogonally polarized beams for converting said two separated parallel orthogonally polarized beams into two separated parallel beams having the same polarization; means optically coupled to said two separated parallel same polarized beams for causing one of said two separated parallel same polarized beams to be reflected twice by one of said pair of plane mirrors and the other of said two separated parallel same polarized beams to be reflected by the other of said pair of plane mirrors to produce two parallel output beams having the same polarization; means optically disposed in the path of one of said two separated same polarized parallel output beams for converting said two separated same polarized parallel output beams into two separated orthogonally polarized parallel output beams; means optically coupled to said two separated parallel orthogonally polarized output beams for converting said two separated parallel orthogonally polarized output beams into a single output beam having a pair of orthogonally polarized frequency components, with a phase difference therebetween being directly proportional to said variable optical path length between said pair of plane mirrors; means optically coupled to said single output beam for mixing said orthogonally polarized components thereof and producing an electrical measurement signal therefrom; and means operatively connected to said electrical measurement signal for extracting said difference in phase from said electrical measurement signal, said extracted phase difference being proportional to said variable optical path length between said pair of plane mirrors; whereby an optical configuration extremely insensitive to measurement error and misalignment is provided for said interferometric system, said tilted parallel plate means comprising a first set of regions of reflection, antireflection and polarizing coatings, said means for converting said two separated parallel orthogonally polarized output beams into said single output beams comprising said first set of regions and coatings on said tilted parallel plate means, said tilted parallel plate means further comprising a second set of regions of reflection, antireflection and polarization coatings, said second set of regions and coatings comprising said input beam converting means.

4,693,606

APPARATUS AND METHOD FOR MEASURING MUSCLE SARCOMERE LENGTH IN VIVO

Richard J. Podolsky, Washington, D.C.; Gordon R. Baker, Rockville, Md., and Bernhard Brenner, Tubingen, Fed. Rep. of Germany, assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Oct. 3, 1985, Ser. No. 784,258
Int. Cl.[4] A61N 5/06
U.S. Cl. 356—355 16 Claims



1. A diffraction apparatus for measuring muscle sarcomere length IN VIVO, comprising:

light soruce means, having a longitudinal axis, for producing a monochromatic and collimated light beam in a direction parallel to said longitudinal axis;

transparent support means for supporting muscle tissue under examination for measurement of its sarcomere length, said support means being located so that monochromatic light passes therethrough; and

screen means for receiving light rays diffracted by the mus-

cle tissue after passage through said transparent support means and for providing a magnified measure of the muscle tissue sarcomere length;

whereby the monochromatic light beam passes through said muscle tissue, diffracting the light beam towards and onto said screen means for determination of said muscle tissue's sarcomere length.

4,693,607

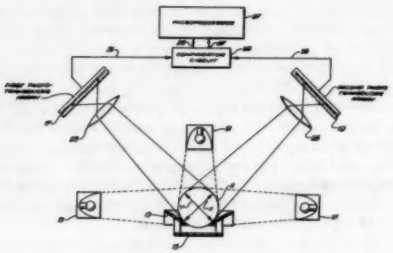
METHOD AND APPARATUS FOR OPTICALLY MEASURING THE VOLUME OF GENERALLY SPHERICAL FRUIT

Tim D. Conway, Stockton, Calif., assignor to Sunkist Growers Inc., Ontario, Calif.

Continuation-in-part of Ser. No. 558,312, Dec. 5, 1983, abandoned. This application May 12, 1986, Ser. No. 862,126

Int. Cl.[4] G01B *11/28*

U.S. Cl. 356—380 **38 Claims**



1. Optical measuring apparatus for measuring the volume of a generally spherical fruit located in a receptacle and for determining if the receptacle contains more than one fruit, wherein the apparatus comprises:

width measuring means for measuring the width of a plurality of narrow, substantially parallel cross sections of the fruit in the receptacle, to produce a set of width measurements;

volume calculating means for calculating the area of each narrow cross section of the fruit based on the corresponding width measurement, and for summing together the calculated areas to produce a measure of the volume of the fruit;

selecting means for selecting the largest width measurement from the set of width measurements;

length measuring means for measuring the length of the fruit in the receptacle by counting the plurality of cross sections; and

ratio means for calculating the ratio of the largest width measurement and the length measurement and for comparing the ratio with one or more predetermined thresholds, to determine if more than one fruit is located in the receptacle.

4,693,608

METHOD AND APPARATUS FOR DETERMINING POSITION OF POINTS ON ARTICLE

Katsuichi Kitagawa, Moriyama, and Kouichi Tamura, Kudamatsu, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Oct. 28, 1985, Ser. No. 792,315

Claims priority, application Japan, Oct. 29, 1984, 59-225793

Int. Cl.[4] G05B *1/00*

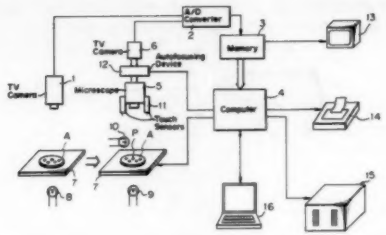
U.S. Cl. 356—394 **4 Claims**

1. A method for locating and inspecting apertures on the surface of an article in an aperture inspecting system comprising the steps of:

detecting apparent positional information of said apertures from an image of the arrangement of said apertures;

detecting a relative difference between said apparent positional information and predetermined positional information according to design data of the arrangement of said apertures;

modifying said apparent positional information by said relative difference, which modified information is transmitted to a subsequent system for positioning said aperture in place for inspecting;



receiving a beam reflected from one surface of said article on which said aperture is opened, said beam including information of an outer edge of a periphery of said aperture;

receiving another beam projected from the opposite side of said article through said aperture, said beam including information of a cross-section of said aperture; and

obtaining a deformation value of said edge by comparing the received information regarding said aperture.

4,693,609

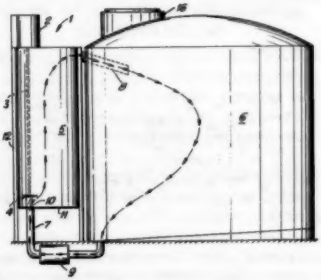
MECHANISM FOR AND METHOD OF AGRICULTURAL CHEMICAL FORMULATION

Robert W. Haynes, Grand Forks, N. Dak., assignor to Terra International, Inc., Sioux City, Iowa

Filed Jan. 16, 1986, Ser. No. 819,363

Int. Cl.[4] B01F *5/10, 7/26*

U.S. Cl. 366—136 **16 Claims**

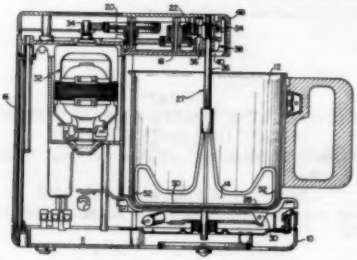


1. A mechanism for agricultural chemical formulation comprising a mixing tank, a dispersion tank, a rotatable shar blade mounted within said dispersion tank, said dispersion tank having a bottom wall and a side wall, means for transferring said formulation from the mixing tank into said dispersion tank through an opening therein, said shar blade being in close adjacency to said opening in the dispersion tank in order to permit the shar blade to strike the formulation as soon as it enters the dispersion tank, and means for returning the formulation back into said mixing tank.

4,693,610
ELECTRICAL HOUSEHOLD APPLIANCE FOR CULINARY PURPOSES

Roger Weiss, Bagnolet, France, assignor to Moulinex, Societe Anonyme, Bagnolet, France

Continuation of Ser. No. 569,475, Jan. 9, 1984, Pat. No. 4,548,508
This application Dec. 5, 1985, Ser. No. 804,634
Claims priority, application France, Jan. 24, 1985, 85 00981
Int. Cl.[4] B01F *15/06*
U.S. Cl. 366—146 **8 Claims**



1. Apparatus for food preparation comprising a base, a mixing bowl received on said base, a rotatable tool within said bowl, a column extending upwardly from said base and having a top end, an arm extending substantially horizontally above the bowl, said arm being supported by the top end of said column and having a free end and said arm further having an upper surface, a spaced lower surface and a lateral surface joining said upper and lower surfaces and defining the lateral extent of the end of the arm, an upwardly extending drive shaft of said tool being engageable with said arm, drive means for said tool contained within said arm, said drive means including a pinion for rotating the drive shaft of said tool, said pinion being fixed to said drive shaft to thereby form a drive assembly for the tool, a recess formed within the free end of said arm within which said drive assembly can be detatchably mounted, a seat for said drive assembly formed within said recess, and an opening provided in said arm by which said recess communicates with the exterior, said opening being so positioned as to enable said drive assembly to be moved into and out of said recess, said opening extending through the lower surface, the lateral surface and the upper surface of the arm, such that said opening comprises a lower zone allowing passage of the drive shaft toward the bowl and a lateral zone allowing passage of the drive shaft laterally out of and into said recess and an upper zone allowing passage of said drive assembly, said bowl being substantially cylindrical in shape, and, when the tool drive assembly is in its mounted position, the drive shaft of the tool extending along the vertical axis of said bowl, and at least one lateral edge of said tool lying in the immediate vicinity of a substantially cylindrical inner wall of said bowl.

4,693,611
FROZEN DESSERT MIXER

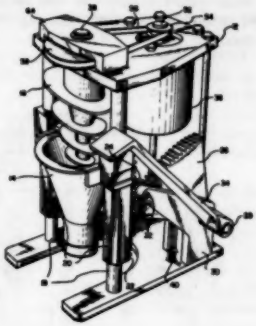
Charles E. Verkler, Peoria, Ill., assignor to International Food Equipment Inc., Peoria, Ill.

Filed Jul. 29, 1985, Ser. No. 760,121
Int. Cl.[4] A23G *9/02*
U.S. Cl. 366—195 **6 Claims**

1. In a frozen dessert mixing machine generally having a mixing cone, a mixing auger and a drive mechanism for driving said cone and auger into operational engagement, improved means for selectively attaching said mixing cone to said drive mechanism comprising:

pivot means secured to said mixing cone; and

position locking means secured to said drive mechanism and adapted to accommodate said pivot means to lock said cone in selected positions and adapted to maintain said

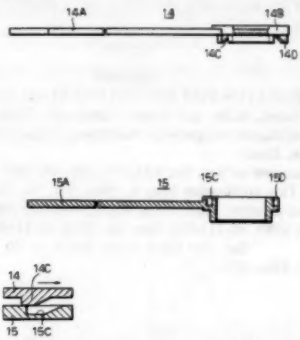


cone in alignment with said auger in at least one of said positions.

4,693,612
ALARM MECHANISM

Keiichi Yoshizawa, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Oct. 1, 1986, Ser. No. 914,127
Claims priority, application Japan, Dec. 27, 1985, 60-298713
Int. Cl.[4] G04B *23/02*
U.S. Cl. 368—74 **10 Claims**



1. An alarm mechanism having an alarm hand and an hour hand coaxially disposed with respect to each other, the hands having respective hand portions and slideably contacting hub portions, cam grooves and cam pawls respectively formed on one and the other of said respective hub portions, said cam grooves and said cam pawls having the same positional relationship with each other relative to the respective hand portions of said alarm and hour hands.

4,693,613
LOGO CLOCK

Douglas Ritchie, Stowe, Mass., assignor to By Design Corp., Cambridge, Mass.

Filed Jan. 31, 1986, Ser. No. 824,743
Int. Cl.[4] G04B *19/04*
U.S. Cl. 368—238 **21 Claims**

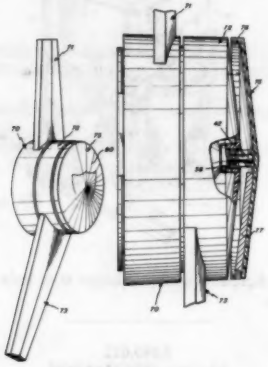
1. A clock comprising:

an hour housing supporting an hour hand integral therewith,

a minute housing supporting a minute hand integral therewith,

a timing mechanism and means supporting the timing mechanism in one of said housings at the rear of the clock,

said timing mechanism having hour driven shaft means coupled to said hour housing for rotatably driving said hour housing and in turn said hour hand, and minute driven shaft means coupled to said minute housing for rotatably driving said minute housing and in turn said minute hand,



means on one of said minute or hour housings for carrying indicia,

means for maintaining the indicia carrying means in a stationary position relative to the adjacent rotating housing, and

means for supporting the timing mechanism in a fixed position.

4,693,614

APPARATUS FOR DETECTING SLAG OUTFLOW

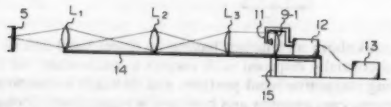
Akio Hatono, Suita, and Sumio Kobayashi, Yamato-Koriyama, both of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 622,287, Jun. 19, 1984, abandoned. This application May 6, 1986, Ser. No. 861,110

Claims priority, application Japan, Jun. 20, 1983, 58-111423; Jun. 20, 1983, 58-111424; Nov. 16, 1983, 58-214020

Int. Cl.[4] G01J *5/00;* **B22D** *11/10*

U.S. Cl. 374—122 **3 Claims**



1. An apparatus for detecting slag outflow when a molten metal covered by molten slag is poured from one vessel to another vessel under sealed conditions by receiving the thermal radiation energy at the microwave frequencies emitted from the pouring stream of molten metal as it is poured from said one vessel to another to detect a change in thermal radiation energy caused by the difference in the emissivities of said molten metal and said molten slag, which comprises:

a microwave-focusing mechanism located at least one meter from said pouring stream composed of a plurality of microwave lenses arranged such that one focal point of one of said lenses is set at a measuring target point at said pouring stream, and a receiving antenna placed on a side of the focusing mechanism opposite to said measuring target point, said plurality of said microwave lenses being supported on a slidable arm extending toward the measuring target point wherein one end of said arm is fixed to a base on which said receiving antenna is mounted;

a waveguide means one end of which is connected to said receiving antenna and which receives the thermal radiation energy from said microwave-focusing mechanism; and

said waveguide means being provided with a purge waveguide comprising a purging mechanism having a conduit from a purge gas source; and

a radiometer connected to the other end of said waveguide means to measure the thermal radiation energy received through said waveguide means.

4,693,615

NON-CONTACT TEMPERATURE MEASUREMENT OF A STATIC OR MOVING TARGET

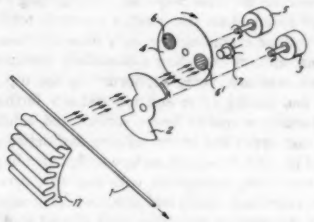
John Kyriakis, 36 Minster Court Hillcrest Road, Ealing, London, England

Filed Jun. 13, 1985, Ser. No. 744,415

Claims priority, application United Kingdom, Jun. 14, 1984, 8415164

Int. Cl.[4] G01N *21/27;* **G01J** *5/52*

U.S. Cl. 374—129 **8 Claims**



1. Apparatus for non-contact temperature measurement of elongated elements such as wires, cables and filaments in a continuous production process for making such elements, the apparatus comprising:

chopper means to be located adjacent at least one of said elongated elements as it passes a given point at which the temperature is to be measured;

first drive means for continuously driving the chopper means to produce trains of intermittent pulses of radiant heat energy being emitted by the elongated element as it continuously moves past the chopper means;

rotary means having first and second wavelength filters mounted thereon in space peripheral relation for being interposed successively into the path of the trains of intermittent pulses of radiant energy produced by the chopper means;

a pyroelectric transducer positioned to receive the filtered trains of intermittent pulses of radiant heat energy successively from the two filters and to provide first and second electrical outputs representative of the radiant heat energy received from the first and second wavelength filters, respectively;

microprocessor means for processing said electrical outputs to form a ratio thereof indicative of the temperature of the elongated element as it passes the given point;

second drive means periodically actuated responsive to a signal from said microprocessor means for driving said rotary means to interpose said filters successively into the path of the trains of intermittent pulses of radiant heat energy produced by the chopper means; and means to prevent extraneous radiation energy from impinging upon the pyroelectric transducer.

4,693,616

BEARING FOR A FLUID FLOW ENGINE AND METHOD FOR DAMPING VIBRATIONS OF THE ENGINE

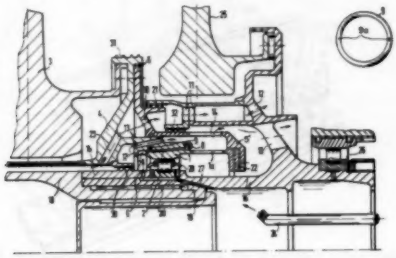
Alois Rohra, and Walter Wildner, both of Munich, Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 9, 1986, Ser. No. 905,784

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1985, 3532456

Int. Cl.[4] F16C *39/04*

U.S. Cl. 384—99 12 Claims



1. An apparatus for damping vibrations in a fluid flow engine, comprising shaft means for supporting engine components, bearing means including an inner bearing race, and an outer bearing race having an outer surface, mounting means for said bearing means having an inner surface facing said outer surface, said outer surface having a smaller diameter than said inner surface for forming a damping gap between said inner and outer surfaces, said damping gap having a fluid flow gap entrance end and a fluid flow gap exit end, fluid flow entrapment chamber means formed around said gap entrance end for accumulating damping fluid in said chamber means, and means for directing a damping fluid flow through said entrapment chamber means into said damping gap, whereby rotation of said entrapment chamber means compresses damping fluid into said damping gap by centrifugal force.

4,693,617

PLAIN JOURNAL BEARING

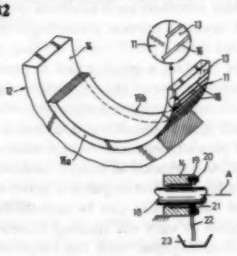
Erich Roemer; Eckhart Schopf, and Günter Cezane, all of Wiesbaden, Fed. Rep. of Germany, assignors to Glyco-Metall-Werke Daelen & Loos GmbH, Wiesbaden, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 634,691, Jul. 26, 1984, abandoned. This application Jul. 14, 1986, Ser. No. 885,080

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1983, 3328509

Int. Cl.[4] F16C *33/04, 33/10*

U.S. Cl. 384—282 10 Claims



1. A slider bearing assembly comprising:

a bearing housing having a bore centered on an axis and having a bore surface;

a uniform composition plain bearing liner in and coaxial with the bore and having an outer surface delimited by two axially oppositely directed end faces and an axial middle region between the end faces and an inner surface, the bore and outer surfaces being in mutual surface contact in a contact area and normally directly engaging each other without the interposition of a liquid lubricant;

means for fixing the bearing liner in the housing against any movement relative thereto other than micromovements;

a movable part having a journal radially outwardly confronting and normally engaging the inner liner surface, the movable part being nonradially movable relative to the liner and housing;

drainage channels formed in at least one of the bore and outer surfaces at the contact area and extending to the axial end faces, the liner being of uniform radial thickness at least between the channels, the area occupied by the drainage channels being at the most 15% of the contact area, the radial depth of the drainage channels being 0.03 mm to 0.2 mm and 2% to 5% of the radial thickness of the plain bearing liner, this radial thickness being at least equal to 4 mm; and

means for withdrawing lubricant from the channels and thereby maintaining the contact area substantially dry.

4,693,618

DOT MATRIX PRINTER PROVIDING MULTIPLE PRINT PULSES FOR ONE ENERGIZATION OF A PRINTING HEAD STEPPING MOTOR

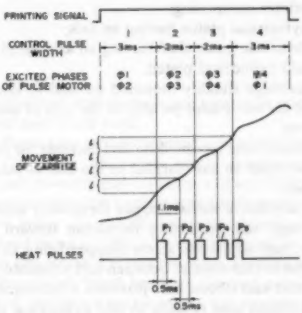
Takayoshi Hanagata, Yamato, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 630,352, Jul. 16, 1984, abandoned, which is a continuation of Ser. No. 458,330, Jan. 17, 1983, abandoned, which is a continuation of Ser. No. 225,340, Jan. 15, 1981, abandoned. This application Mar. 24, 1986, Ser. No. 844,245

Claims priority, application Japan, Feb. 22, 1980, 55-20544

Int. Cl.[4] B41J *3/12*

U.S. Cl. 400—120 2 Claims



1. A dot matrix printer with a stepping motor for relatively moving a printing head and a printing sheet, comprising:

a printing head having at least one printing element for printing on the printing sheet in response to print pulses;

a stepping motor for relatively moving said printing head and the printing sheet once during each excited phase of said stepping motor;

motor drive signal generating means for generating a motor drive pulse;

motor drive means operable in response to the motor drive pulse for exciting each phase of said stepping motor to drive said stepping motor;

timer means having a set time period, said timer means being operable in response to the motor drive pulse for generating an additional pulse preceding the next motor drive pulse at the set time period; and

head drive means for generating print pulses in response to both the motor drive pulse and the additional pulse,

wherein the set time period of said timer means is selected so that the distance between dots produced in response to the print pulses is uniform.

4,693,619

STEPPING MOTOR OPERATED POSITIONING DEVICE FOR A RIBBON LIFTER IN A PRINTER

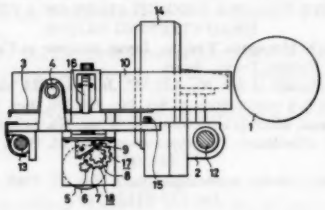
Hidekazu Ishii, and Chihiro Kosaka, both of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1985, Ser. No. 790,502

Claims priority, application Japan, Oct. 26, 1984, 59-225536

Int. Cl.[4] B41J *35/14*

U.S. Cl. 400—212 1 Claim



1. A printer comprising:

(a) a cylindrical platen having an axis;

(b) at least one guide shaft having an axis parallel to the axis of said cylindrical platen;

(c) a carriage slidably mounted on said at least one guide shaft for movement parallel to the axis of said cylindrical platen;

(d) a ribbon base mounted on said carriage for pivotal movement about an axis parallel to the axis of said cylindrical platen;

(e) an adjustable screw stopper threadably mounted in said carriage and projecting therefrom toward said ribbon base, said adjustable screw stopper being sized and positioned so that contact between said adjustable screw stopper and said ribbon base provides a reference position for said ribbon base relative to said cylindrical platen and so that the point of contact between said adjustable screw stopper and said ribbon base is adjustable by movement of said adjustable screw stopper relative to said carriage;

(f) a stepping motor mounted on said carriage;

(g) a sector gear mounted on said ribbon base, said sector gear being concentric to the axis about which said ribbon base pivots; and

(h) a power transmitting mechanism operatively connecting said stepping motor to said sector gear, said power transmitting mechanism comprising a torque limiter designed to slip at a torque less than the maximum torque produceable by said stepping motor, whereby, if in use said ribbon base comes into contact with said adjustable screw stopper before said stepping motor has stepped out, said stepping motor continues to rotate, thereby preventing an out-of-phase condition of said stepping motor.

4,693,620

VARIABLE WIDTH PAPER FEEDER FOR PERFORATED AND UNPERFORATED PAPER

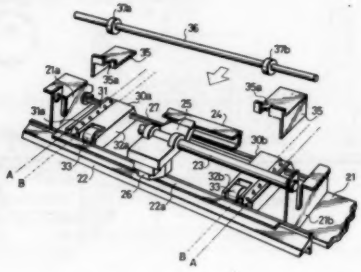
Masatoshi Harumatsu, Tamayama, Japan, assignor to Alps Electric Co.,Ltd., Japan

Filed Sep. 3, 1985, Ser. No. 771,888

Claims priority, application Japan, Aug. 31, 1984, 59-132182[U]

Int. Cl.[4] B41J *11/30*

U.S. Cl. 400—611 5 Claims



1. A paper feeder capable of feeding both a paper of the type having perforated edges by engaging the perforations of the edge of the perforated paper and a paper of the type having unperforated edges by engaging the surface of the unperforated paper, comprising:

a pair of slide blocks adjustably slidable along a drive shaft extending in a first horizontally defined direction so as to vary the spacing between the slide blocks in accordance with the width and type of paper to be engaged by said slide blocks;

each slide block extending in a second horizontal direction normal to the first direction and having a pair of opposite vertical side walls extending in the second direction, wherein the paper is fed along a feed path in a horizontal paper feeding direction parallel to the second direction, a track rotating body mounted between said side walls at an outside location of said slide block on whose peripheral surface there is provided a plurality of pins for engaging the perforations of the perforated type of paper, a drive roller mounted between said side walls at an inside location of said slide block which has a frictional surface for engaging the unperforated type of paper, and drive means in said slide block for engaging said drive shaft and driving said track rotating body and drive roller in rotation so as to drive the corresponding type of paper engaged therewith in the paper feeding direction;

a pair of holder members each mounted on a respective slide block and having a portion extending over the paper feed path formed with a pinch roller holding portion which is aligned for holding a pinch roller in position for contact with the drive roller of the respective slide block; and

a pair of pinch rollers mounted adjustably slidably on a roller shaft which is movable toward said slide blocks so as to bring said pinch rollers into engagement with the holding portions of the respective holder members and into frictional contact with the respective drive rollers,

wherein said slide blocks can be adjustably moved in said first direction to vary the spacing therebetween and said pinch rollers, engaged with the respective holding portions of said holder members, can be adjustably moved with said slide blocks in said first direction so as to remain in positions of frictional contact with said drive rollers mounted in said slide blocks.

4,693,621

PAPER LOADING DEVICE OF PRINTER

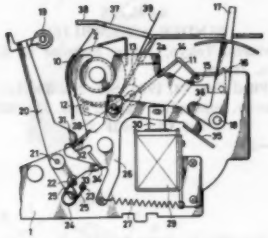
Katsuhiko Kawaguchi, Nirayama, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 695,083, Jan. 25, 1985, abandoned. This application Aug. 4, 1986, Ser. No. 891,426

Claims priority, application Japan, Jan. 25, 1984, 59-11622; Feb. 1, 1984, 59-16870

Int. Cl.[4] B41J *23/048, 13/20*

U.S. Cl. 400—636.1 **3 Claims**



1. An automatic loading device for a printer, comprising:

a platen connected to be rotated by a feed motor to feed paper;

a pinch roller mounted for movement toward and away from said platen;

a manipulating lever for manually positioning said pinch roller;

a pair of left and right paper bail arms mounting a paper bail roller for rotation in opposing relationship to said platen and wherein said paper bail arms include means for pivotal motion to move said paper bail roller toward and away from said platen;

a toggle spring for urging said paper bail arms toward and away from said platen on opposite sides of a neutral position of said paper bail arms;

an operating member having a pressing portion for pressing said paper bail arms away from said platen and a stopper, separate from said pressing portion, for supporting said paper bail arms at a position just on the platen side of said neutral position when said paper bail arms are pressed by said pressing portion of said operating member;

an electromagnetic actuating means for displacing said operating member to press against said paper bail arms to move said paper bail roller away from said platen whereby said device automatically feeds paper without any need for manual movement of said paper bail arm; and

said stopper serving as a means for stopping said paper bail arms at a second position on the opposite side of said neutral position from the platen side, said paper bail arms being urged toward and maintained in said second position by said toggle spring when said paper bail arms are manually operated to move said paper bail roller away from said platen.

4,693,622

COMBINED TOOTHBRUSH AND TOOTHPASTE DISPENSER

Peter A. Booth, Furtherfields, Chenies Road, Chorley Wood, Hertfordshire, WD3 5LU, United Kingdom

PCT No. PCT/GB85/00113, § 371 Date Nov. 26, 1985, § 102(e) Date Nov. 26, 1985, PCT Pub. No. WO85/04314, PCT Pub. Date Oct. 10, 1985

PCT Filed Mar. 25, 1985, Ser. No. 807,896

Claims priority, application United Kingdom, Mar. 26, 1984, 8407759

Int. Cl.[4] A46B *11/02*

U.S. Cl. 401—191 **7 Claims**

1. A combined toothbrush and toothpaste dispenser which is characterised by being collapsible into a compact unit for convenient carriage by a user, comprising.

an elongated body casing which also serves as handle means and which is defined by proximal and distal ends having elongated side wall means extending therebetween, said proximal end including proximal end wall means,

a toothbrush member located at said proximal end of said body casing and including arm means mounted in said body casing and a brush head supported at the distal end of said arm means and having bristles projecting generally perpendicularly from said brush head,

means slidably mounting said arm means adjacent said side wall means of said body casing for relative longitudinal movement substantially parallel to said side wall means between a retracted position in which said brush head is disposed adjacent and externally of said proximal end wall means of said body casing and an adjustable extended position,

articulating means adjustably supporting said brush head from said distal end of said arm means, whereby said brush head is movable between a first position in which said brush head is aligned with said arm means and a second position in which said brush head is substantially perpendicular to said arm means, said articulating means including means for resisting movement of said brush head, and said brush head generally lying within the boundaries of

said proximal end wall means when located in said second position of said brush head,

toothpaste dispensing means disposed within said body casing and including discharge nozzle means extending through said proximal end wall means of said body casing,

discharge means operable to discharge toothpaste from said dispensing means via said discharge nozzle means,

said brush head being settable in said second position thereof when said arm means is in said retracted position, whereby said bristles of said brush head are directed towards and overlie said discharge nozzle means for receiving toothpaste therefrom in response to operation of said discharge means,

manual actuating means for controlling operation of said discharge nozzle means,

indexing means associated with said manual actuating means for defining at least one indexed position of said manual actuating means, whereby to provide for dispensing of a metered quantity of toothpaste in response to operation of said discharge nozzle means by said manual actuating means, and

valve means which is adapted to operate in response to operation of said discharge nozzle means by said manual actuating means and which closes said discharge nozzle means in said at least one indexed position of said manual actuating means and opens said discharge nozzle means between successive indexed positions.

4,693,623

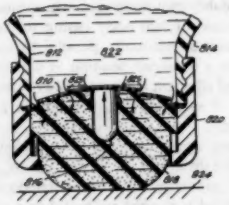
PRESSURE-RESPONSIVE VALVE FOR AN APPLICATOR

Gilbert Schwartzman, Westchester County, N.Y., assignor to Dab-O-Matic Corp., Mt. Vernon, N.Y.

Division of Ser. No. 585,754, Mar. 2, 1984, Pat. No. 4,620,648, which is a continuation-in-part of Ser. No. 395,111, Jul. 6, 1982, abandoned. This application May 28, 1986, Ser. No. 868,287

Int. Cl.[4] B05C *17/00*

U.S. Cl. 401—206 **7 Claims**



1. A dispensing apparatus comprising a fluid container including a mouth, an applicator, means for holding said applicator in the mouth of said container, a normally closed pressure-responsive valve for permitting the flow of fluid from said container to said applicator upon the application of pressure to said valve, said valve including a diaphragm formed of elastically deformable fluid impermeable material with a plurality of non-intersecting arcuate slits therein, each slit having a base which is intersected by at least one other slit, each slit being out of intersecting relation with its own base, and means for disposing said valve in said container inside of said applicator.

4,693,624

BINDING MECHANISM FOR PERFORATED PAPERS

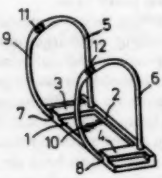
Helmut Moosmüller, Martin Luther Str. 9, D-7733 Mönchweiler, Fed. Rep. of Germany

Filed Jul. 10, 1985, Ser. No. 753,666

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1984, 3425827

Int. Cl.[4] B42F *13/10, 13/02*

U.S. Cl. 402—22 **15 Claims**



1. A binding mechanism for perforated papers comprising, a flat support strip of plastic having a long dimension and a short dimension for supporting a stack of perforated paper, at least two elastically flexible tangs partly integrally formed as one piece with and on top of said flat support strip, said tangs being spaced along the long dimension and being insertable in passages of the support strip for the formation of loop-like ring arcs of different size, which passages are arranged directly below the tangs and extend across the short dimension of the support strip, the tangs being made in two parts, the tangs each comprising a tang section which is integrally formed perpendicular upright on the support strip top side at one side of said strip and an extension piece connected with the tang section and mechanically releasably locked to the tang section, said extension pieces being lockable against axial displacement at insertion-side ends of the passages by releasable fixing means, said insertion-side ends being on an opposite side of said strip from said upright tang sections, the passages being provided at their insertion-side ends with an engaging edge for engaging one of the extension pieces, the extension pieces having counter sunk in their surfaces a locked tooth system extending in a longitudinal direction thereof, the passages having at their insertion-side end an elastically flexible supporting tongue directed from a bottom thereof upwardly and offset toward and outside of the passage relative to the engaging edge.

4,693,625

BINDER ASSEMBLIES

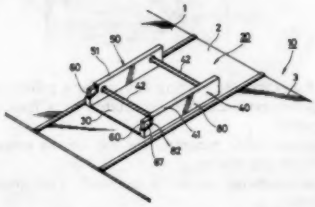
Kiyoshi Ohminato, Tokyo, Japan, assignor to King Jim Co., Ltd., Tokyo, Japan

Filed Feb. 18, 1986, Ser. No. 830,122

Claims priority, application Japan, Jun. 27, 1985, 60-98923

Int. Cl.[4] B42F *3/04*

U.S. Cl. 402—27 **7 Claims**



1. A binder assembly, comprising:

a first rotatable member; and

a second rotatable member, wherein said first rotatable member comprises at least one binding rod and said second rotatable member comprises at least one binding pipe adapted to receive said at least one binding rod, and wherein said first and second rotatable members are separately and detachably provided on both sides of a bottom plate fixed to a back of a file in such a manner that said first and second rotatable members are turnable with respect to said bottom plate.

4,693,626

FOLDER FOR PAPER SHEETS, ESPECIALLY EDP PAPER SHEETS

Manuel Ferreira-Godinho, Bergiusweg 10, D-3250 Hameln 1, Fed. Rep. of Germany

Filed Oct. 16, 1986, Ser. No. 920,255

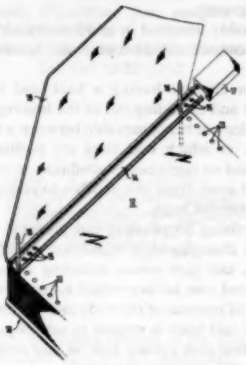
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1985, 3537026

Int. Cl.[4] B42F *3/00, 13/14, 11/00, 13/00*

U.S. Cl. 402—73 **15 Claims**

1. A folder for paper sheets, especially EDP paper sheets (32) having at least two spaced punched holes (34) at their lateral margins, comprising an integral carrier body or cover (21), a plurality of resilient line-up pins or sheet retainers (36) for accommodating the paper sheets (32) through the punched holes (34), retaining means (38, 40) for securely fixing the line-up pins or sheet retainers (36) and the paper sheets (32), said carrier body or cover (21) being an integral injection moulded part and including a bottom part (22) having an integral connection to a back part (24) and having an integral connection to a top part (26) to form a suitable unit, said bottom part (22) of said carrier body or cover (21) including a first and second plurality of securement holes (42) arranged along first and second lines (43, 45) which are normal to each other, said line-up pins or sheet retainers (36) being removably selectively mounted in said holes for repositioning thereof, and said

retaining means (38, 40) including telescope-type clamping bars (38) having means to accommodate the protruding ends



(39) of the line-up pins or sheet retainers (36) and are separate from the top part (26).

4,693,627

DEVICE FOR FIXING THE SADDLE OF A BICYCLE TO A SADDLE PILLAR AND FOR ADJUSTING THE INCLINATION OF THE SADDLE

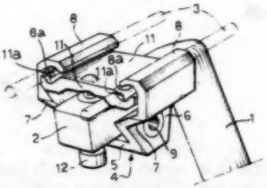
Lucio Borromeo, Turin, Italy, assignor to 3 T S.p.A., Turin, Italy

Filed Jun. 19, 1986, Ser. No. 876,155

Claims priority, application Italy, Jul. 26, 1985, 53642/85[U]

Int. Cl.[4] F16C *11/00*

U.S. Cl. 403—24 **6 Claims**



1. A device for fixing a saddle to a saddle pillar of a bicycle wherein said saddle is provided with a frame framing two longitudinal, parallel, spaced-apart rods, said device comprising:

an abutment member having seats for engaging the two rods of the saddle from above and which is coupled to the head of the saddle pillar so as to be rotatable about a transverse axis of rotation perpendicular to the two rods but not movable vertically,

a thrust plate which engages the two rods of the saddle from below,

a pair of screws threaded substantially vertically through the head of the saddle pillar on the opposite sides of said transverse axis of rotation with their ends engaging the lower surface of the thrust plate, to cause clamping of the rods of the saddle against the seats of the abutment member as a result of the upward thrust exerted by the screws on the thrust plate, and to allow adjustment of the inclination of the saddle by the tightening of one of the screws and the loosening of the other,

said abutment member being in the form of a bracket having a cross member, means adjacent the cross member for engaging the lower surface of the saddle pillar with a rotatable coupling, and two lateral arms which each comprise, starting from the cross member:

a first straight portion which extends into contact with a respective lateral face of the head of the saddle pillar,

a second outwardly inclined portion, and

an end portion whose end is bent inwardly and carries a seat for a respective rod of the saddle frame, the thrust plate being disposed between the end portions of the two arms of the bracket.

4,693,628

BALL JOINT, ESPECIALLY FOR MOTOR VEHICLES

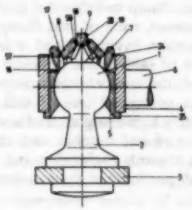
Rolf Renk, Ginsheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 7, 1986, Ser. No. 848,577

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1985, 3515303

Int. Cl.[4] F16D *1/12*

U.S. Cl. 403—135 **6 Claims**



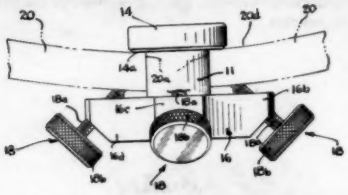
1. A ball joint, especially for motor vehicles, comprising a spherical ball having a shank, a socket having an opening on one side and axially extending slots for receiving and engaging said spherical ball, a housing comprising a metal ring surrounding said socket and having one end engaging an abutment means carried by said socket adjacent said one side thereof, and a bracing and clamping mechanism formed integral with said socket and adjacent said spherical ball at its end remote from its shank for retaining said socket within said steel ring and preventing relative axial displacement relative thereto, the improvement being that said bracing and clamping mechanism includes a plurality of annularly spaced hook-like members integrally hinged at one end to said socket via first hinges, a plurality of bracing members being integrally hinged at their outer ends with the other ends of adjacently located ones of said hook-like members via second hinges and a thrust member integrally hinged with the inner ends of said bracing members via third hinges, said bracing and clamping mechanism being movable between an unclamped position in which said third hinges have their pivot axes spaced further from said spherical ball than the axes of said second hinges and said hook-like members are disengaged from said metal ring at its other end to permit disassembly of said ball joint and a clamped position in which said hook-like members engage said other end of said steel ring and said third hinges have their axes located closer to said spherical ball than the axes of said second hinges by pushing said thurst member of said bracing and clamping mechanism toward said spherical ball whereby said bracing and clamping mechanism functions as an over-center toggle mechanism to retain said socket in place on the metal ring and to biasingly hold said socket in engagement with said spherical ball.

4,693,629

FASTENER FOR JOINING PANELS TO EACH OTHER

Robert F. Bruinsma, Northridge, Calif., assignor to Datron Systems, Inc., Simi Valley, Calif.

Filed Nov. 25, 1985, Ser. No. 801,415
Int. Cl.[4] F16B *3/00*; F04C *1/30*
U.S. Cl. 403—170 7 Claims



1. A fastener for joining together a plurality of panel members at their corners, said panel members having opposite surfaces, said fastener comprising:

a central hub portion, the panel corners being shaped to matingly engage said hub portion;

an overlapping portion extending transversely from one end of the central hub portion, said overlapping portion abutting against one of the surfaces of said panels; and

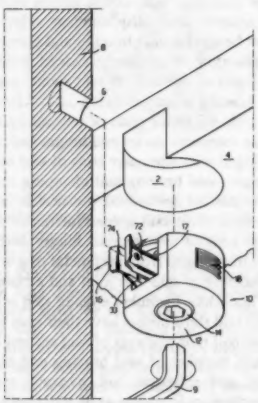
a separate clamp member for joining each of the panels to the fastener, each of said cheap members comprising an arm portion having an end, a notch being formed in the surface of said panels opposite said one of the surfaces thereof, the ends of said arm portions each being fitted into an associated one of said notches, and means for separately tightening each of said arm portions against the surfaces of said notches such that the panel corners are driven towards each other and in tight abutment against the hub portion and the overlapping portion.

4,693,630

FASTENING DEVICE FOR RELEASABLE INTERCONNECTION OF PANELS

Fiorello Giovannetti, Segrate, Italy, assignor to Laura Giovannetti and Antonio Giovannetti, both of Segrate, Italy, a part interest to each

Filed Oct. 16, 1984, Ser. No. 661,439
Claims priority, application Italy, Oct. 18, 1983, 23348 A/83
Int. Cl.[4] F16B *12/02*
U.S. Cl. 403—405.1 13 Claims



1. A fastening device for releasable interconnection of two elements, in one of which said device is accommodated and in the other of which an engagement hole is provided, said device comprising:

a housing element;

a body rotatably mounted in said housing element;

a resilient element located between said housing element and said body;

said resilient element having a back and arms extended therefrom and extending out of the housing element, said resilient element being movable between a disengagement condition, at which said arms are positioned near one another, and an engagement condition, at which said arms are spread apart from one another to engage the walls of said engagement hole,

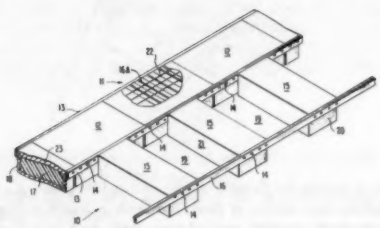
said body defining cooperating cam means to urge said arms from said disengagement condition to said engagement condition, said cam means including a first cam surface and a second cam surface which is eccentric with respect to an axis of rotation of the body and the first cam surface, and when said body is rotated to said engagement condition said first cam surface acts on said arms and said second cam surface acts on said back.

4,693,631

FLOATING BREAKWATER

Robert J. McKay, Pullenvale, Australia, assignor to Pacific Marina Developments Pty. Ltd., Australia

Continuation-in-part of Ser. No. 771,083, Aug. 30, 1985, abandoned. This application Jul. 17, 1986, Ser. No. 886,493
Claims priority, application Australia, Aug. 30, 1984, PG6847
Int. Cl.[4] E02B *3/04*
U.S. Cl. 405—26 3 Claims



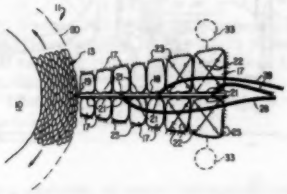
1. A breakwater comprising a rear continuous block formed by a plurality of modules in abutting relation wherein each module has an internal sheath formed from floatable material and an external core formed from concrete, a rear block interconnection strip contacting each rear surface of said module of said continuous block and a front block interconnection strip contacting each front surface of said modules of said continuous block, a first plurality of elongated fasteners extending through and interconnecting said modules and said front and rear block interconnection strips, a plurality of spaced apart fingers each having a construction similar to the construction of each module disposed in engagement with said front block interconnection strip and extending outwardly away from said rear continuous block, a continuous finger interconnection strip contacting the front surface of each of said fingers and a second plurality of elongated fasteners extending through and interconnecting said strips, said fingers, and said rear continuous block.

4,693,632

SYSTEM AND METHOD FOR CONTROLLING EROSION OF A SHORELINE

Roger W. Ingersoll, Carrollton, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 28, 1986, Ser. No. 856,566
Int. Cl.[4] E02B 3/12
U.S. Cl. 405—18 2 Claims



1. A system for controlling erosion of the slope below the waterline of a shoreline, said system comprising:

an elongated conduit;

means to pivotably secure said conduit to said shoreline approximately at said waterline;

a plurality of individual armor bags attached to said conduit; and

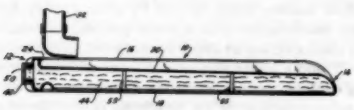
means for filling all of said individual armor bags with a grout material whereby said armor bags when filled with said grout material will be positioned as a unit onto said slope below said waterline.

4,693,633

RUN-OFF TROUGH

Louis Giordano, P.O. Box 136, Linwood, N.J. 08221

Filed Nov. 8, 1984, Ser. No. 669,636
Int. Cl.[4] E02B 9/04; E04D 13/08
U.S. Cl. 405—119 8 Claims



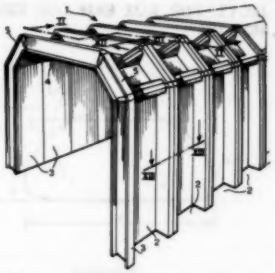
1. A light-weight splash block easily portable to the base of a down spout but unintentionally displaceable therefrom only with difficulty comprising a light-weight molded rigid plastic body means having a top surface formed in the shape of a run-off trough means for directing water away from a down-spout, said body means forming a hollow chamber adapted to hold and retain a charge of a fluent material substantially greater in weight than said light-weight molded rigid plastic body, said body means having therein an opening to permit charging said hollow body with such fluent material, whereby said splash block may easily be transported while empty into proximity of a down spout, and thereupon be filled with a heavy fluent charge and rendered thereby sufficiently heavy to be unintentionally displaceable only with difficulty.

4,693,634

PREFABRICATED SUPPORT AND COVERING STRUCTURE, PARTICULARLY FOR CONSTRUCTING TUNNELS, BRIDGES AND THE LIKE

Carlo Chiaves, Turin, Italy, assignor to Tensiter S.p.A., Turin, Italy

PCT No. PCT/EP85/00259, § 371 Date Feb. 5, 1986, § 102(e) Date Feb. 5, 1986, PCT Pub. No. WO85/05653, PCT Pub. Date Dec. 19, 1985
PCT Filed May 31, 1985, Ser. No. 834,277
Claims priority, application Italy, Jun. 5, 1984, 67581 A/84
Int. Cl.[4] E21D 5/00
U.S. Cl. 405—126 4 Claims



1. A prefabricated support and covering structure particularly for making artificial tunnels, small bridges and the like, comprising a plurality of modular bodies, in the form of a polygonal section having an outer convex surface and an inner concave surface when disposed side-by-side in succession along the longitudinal axis of the structure, each modular body including a plurality of prefabricated panels of reinforced concrete having adjacent end faces, each panel being connected to the adjacent panel by articulation means comprised of a plurality of connecting reinforcement rods extending without interruption from each panel to the adjacent panel to allow relative rotation between adjacent panels from a coplanar disposition to an erect, folded postion in which portions of the end faces of adjacent panels are brought into mutual contact, the improvement comprising:

said connecting reinforcement rods having portions between each pair of adjacent panels which are inclined to each other and intersect on a common straight line substantially parallel to the longitudinal axis of the structure, the said straight line forming an articulation hinge axis,

said connecting reinforcement rods extending from each panel to the adjacent panel being disposed in proximity to the outer convex surface of the prefabricated structure,

each of said end faces of the adjacent panels being inwardly inclined and being provided, in proximity to the concave inner surface of the prefabricated structure, with a front edge which is substantially parallel to the longitudinal axis of the prefabricated structure; the two front edges of each pair of adjacent panels being substantially in longitudinal contact with each other so as to constitute a reciprocal abutment and to define, with the respective adjacent surfaces of the said end faces, a longitudinal space filled with a binding material cast on site, and

wherein said panels of each modular body have lateral faces spaced from the lateral faces adjacent modular bodies and have lateral flanges spaced apart and disposed substantially parallel to a polygonal line which defines the cross section of the prefabricated structure, said lateral flanges of one modular body being substantially in contact upon erection with the corresponding lateral flanges of the adjacent modular body so as to form a space between said lateral faces and lateral flanges extending parallel to the said polygonal line and interposed between the two adja-

cent modular bodies, the said space being filled with binding material cast on site.

4,693,635

METHOD OF PRODUCING HOLLOW STRUCTURES AND HOLLOW STRUCTURES

Marcel Matiere, 17 Avenue Aristide Briand, 15000 Aurillac, France

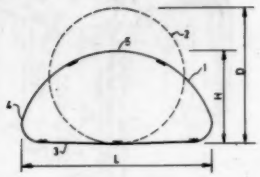
PCT No. PCT/FR82/00177, § 371 Date Jul. 15, 1983, § 102(e) Date Jul. 15, 1983, PCT Pub. No. WO83/01823, PCT Pub. Date May 26, 1983

PCT Filed Oct. 29, 1982, Ser. No. 522,169

Claims priority, application France, Nov. 17, 1981, 81 21510; Jun. 11, 1982, 82 10266

Int. Cl.[4] F16L *9/22*; E03F *3/00*; E21D *11/00*

U.S. Cl. 405—132 **7 Claims**



1. A method for producing an elongated hollow semi-cylindrical body comprising a semi-cylindrical wall and a flattened base which supports said body while lying on a groundsite, said method comprising the following steps:

determining by calculation, the individual stresses and the optimal profile of the hollow semi-cylindrical body, taking into account the totality of the known parameters relative to the site, the conditions of use and the intrinsic charactertistics of the body;

dividing said optimal profile into adjacent parts, at least some of the edges between adjacent parts being situated in the vicinity of stress nodes, where the absolute value of calculated stresses transverse to said semi-cylindrical wall of the body is at a minimum;

determining the stresses to which each of said parts will be subjected in use;

preparing longitudinal components, each corresponding to one of said parts of the cross-section, having the same transverse curvature as the corresponding part, each of said components being formed of a conventional material; and

assembling said longitudinal components for constituting at least one part of said body having a whole cross-section.

4,693,636

PIPELINE PULL-IN METHOD AND APPARATUS

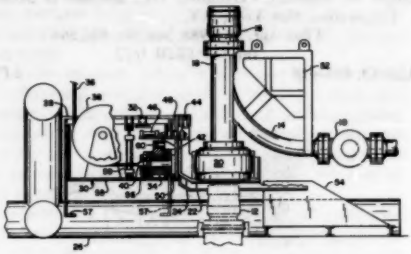
Thomas A. Fraser, Jr., Ventura, Calif., and Andrew R. Macfarlane, London, England, assignors to Vetco Gray Inc., Houston, Tex.

Filed Dec. 31, 1980, Ser. No. 221,594

Int. Cl.[4] F16L *1/04*

U.S. Cl. 405—169 **18 Claims**

1. A pipeline pull-in apparatus for pulling in and securing a pipeline to a subsea anchor pile comprising: a tool supporting receptacle; a template structure, including means for spacing said receptacle at a predetermined location with respect to the anchor pile; a pull-in tool adapted to fit within said supporting receptacle; locking means for locking said pull-in tool to said receptacle at a predetermined location; at least one alignment funnel located on said pull-in tool; means for guiding a pull-in cable through said funnel; a sled secured to and carrying the end of the pipe to be secured; a lower anchor pile connector secured to said sled; a bridle attached to said sled; means for remotely detaching said bridle from said sled; at least one alignment pin mounted on said bridle and adapted to mate with



said alignment funnel; and means for attaching a pull-in cable to said bridle.

4,693,637

GRAVITY TYPE OCEANIC STRUCTURE AND ITS STABLE INSTALLATION

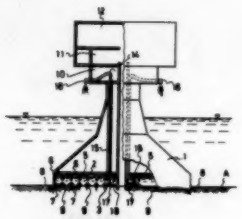
Yoshio Suzuki; Yoshio Suzuki; Satoshi Saitoh; Mitsuoki Yamamoto, all of Tokyo, and Hisashi Hosomi, Saitama, all of Japan, assignors to Takenaka Komuten Co., Ltd., Osaka, Japan

Filed Nov. 26, 1985, Ser. No. 801,847

Claims priority, application Japan, Dec. 20, 1984, 59-270240

Int. Cl.[4] E02B *17/00*

U.S. Cl. 405—224 **10 Claims**



1. A method of utilizing a gravity-type transferable oceanic structure of the type including a body; ballasting means within at least a portion of said body; a hollow bottom, extending from a lower end of said body, which is of larger dimension in horizontal cross-section than an upper portion of said body, said hollow bottom being formed by a circumferential wall extending downwardly from a lower periphery of said body, an upper slab covering an upper opening within the circumferential wall, and a lower slab spaced from said upper slab and covering a lower opening within the circumferential wall so as to form substantially an entire bottom surface of the structure, said lower slab having a plurality of through holes distributed throughout its surface area; and a skirt protruding downwardly from a lower periphery of said circumferential wall; said method comprising the steps of:

pouring water into said ballasting means so as to sink the oceanic structure into a body of sea water by the combined weight of the structure and the water in the ballasting means to thereby settle the structure on a sea bottom; settling the structure on the sea bottom so as to thrust the skirt into the sea bottom and intercept the flow of sea water around the skirt and into ground under said structure; and

periodically pumping water from the hollow bottom to the exterior of the structure to maintain pressure within the hollow bottom equal to the atmospheric pressure, so that said lower slab is pressed to the sea bottom by a pressure

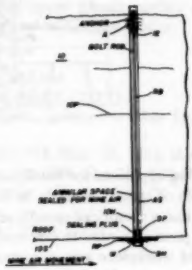
difference between upward air pressure applied to the upper slab and downward water pressure applied to the exterior of the structure.

4,693,638

ROOF BOLT ASSEMBLY HAVING A SEALING PLUG FOR PREVENTING A DETERIORATION OF THE MINE ROOF

Konstanty F. Unrug, 2917 Waco Td., Lexington, Ky. 40503; Edward D. Thompson, 132 Calmes Blvd., Winchester, Ky. 40391, and Samir K. Nandy, 3489 Lansdowne Dr. Apt. 38, Lexington, Ky. 40502

Filed Apr. 22, 1986, Ser. No. 854,504
Int. Cl.[4] E21D *21/00*
U.S. Cl. 405—259 **3 Claims**



1. In a roof bolt assembly for preserving the natural geological structure of a mine roof including an elongated bolt rod with first and second distal ends, an expandable anchor threaded on the first end for operatively engaging the walls of a roof bolt hole bored in the mine roof at points inboard of the roof surface, a bolt head on the second end of the bolt rod, and a roof plate sandwiched between the roof surface and said bolt head, the entire assembly being pre-tensioned to tightly hold said roof plate against the roof surface, said hole bored in said roof being larger in diameter than the diameter of the roof bolt rod defining an annular space around the rod, the improvement comprising:

sealing means totally disposed within said annular space adjacent the second end of said bolt but spaced from said roof plate, said sealing means further being spaced from said roof surface such that a gap is formed between the roof surface and the sealing means, said sealing means precluding the entrance of air and moisture into said hole, said annular space around the rod being generally free from material in a region between the anchor and the sealing means such that said bolt is generally out of contact with the mine roof in this region.

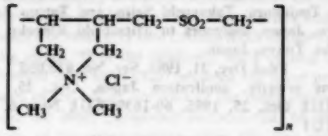
4,693,639

CLAY STABILIZING AGENT PREPARATION AND USE

Keith H. Hollenbeak, and Paul S. Brown, Jr., both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jun. 25, 1986, Ser. No. 878,160
Int. Cl.[4] E02D *3/12*
U.S. Cl. 405—263 **7 Claims**

1. A method of preparing a water soluble clay stabilizing agent comprising polymerizing diallyldimethylammonium chloride with sulfur dioxide, said polymerization being carried out in an aqueous solution in the presence of a polymerization reaction rate retarder comprising an erythorbic acid salt to form a copolymer having the structural formula:



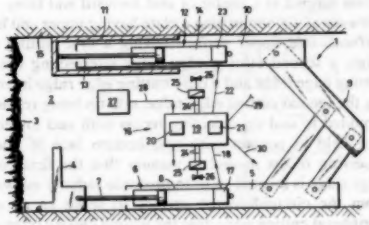
and having a nitrogen-to-sulfur mole ratio in the range of from about 1.0 to about 1.4 and n is an integer equal to the numbers of repeating units in the polymer required to give a molecular weight in the range of from about 1000 to about 100,000.

4,693,640

METHOD OF CONTROLLING HYDRAULICALLY ACTUATABLE ARRANGEMENT IN UNDERGROUND MINING

Karl-Heinz Berger, Gelsenkirchen-Resse, Fed. Rep. of Germany, assignor to Bochumer Eisenhütte Heintzmann GmbH & Co KG, Bochum, Fed. Rep. of Germany

Filed Aug. 5, 1986, Ser. No. 893,568
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1986, 3538251
Int. Cl.[4] E21D *23/12*
U.S. Cl. 405—294 **5 Claims**



1. A method of controlling a plurality of hydraulically-actuated arrangements in underground excavations, comprising the steps of providing an electrical power supply; connecting a plurality of control devices with said power supply and interconnecting the control devices with one another; arranging a plurality of current-suppliable consumers to be connected with the control devices; comparing in each of the control devices a coded information about a number of consumers which have been current supplied from the power supply with a maximum possible number of consumers which can be supplied from the power supply; determining from the comparison the number of the consumers which still can be current-supplied and obtaining by the control device a release for current supplying such consumers; adding consumers which are released by the control device and current supplied with the consumers which have been indicated in the control device as current-supplied; and further transferring the result of the addition in coded form to a next control device.

4,693,641

END MILL WITH THROW-AWAY TIP

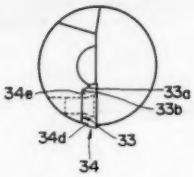
Osamu Tsujimura; Takayoshi Saito, and Tatsuo Arai, all of Tokyo, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1985, Ser. No. 815,055

Claims priority, application Japan, Oct. 25, 1985, 60-163962[U]; Oct. 25, 1985, 60-163963[U]; Nov. 6, 1985, 60-170488[U]

Int. Cl.[4] B23C *5/20*

U.S. Cl. 407—42 27 Claims



1. An end mill comprising:

an end mill body having an axis of rotation therethrough and having forward and rearward ends, said forward end having a forward end face and a circumferential surface, said forward end having at least one pocket formed therein and opening to both said circumferential surface and said forward end face, said pocket including a tip receiving recess having a bottom face facing in a direction of rotation of the body, said body having a core receiving recess formed at a center of said forward end face;

a throw-away tip comprising a plate having upper and lower surfaces, said upper surface having a first cutting edge ridge, a second cutting edge ridge intersecting the first cutting edge ridge and a third cutting edge ridge intersecting the second cutting edge ridge, said tip being releasably mounted in said tip receiving recess with said lower surface held in contact with said bottom face of said tip receiving recess in such a manner that the first cutting edge ridge is located so as to protrude radially outwardly from the circumferential surface to serve an an outer peripheral cutting edge, that the second cutting edge ridge is located so as to protrude forwardly from the forward end face to serve as an end cutting edge, and that the third cutting edge ridge is located so as to protrude radially inwardly of the body into the core receiving recess to serve as an inner peripheral cutting edge, said end cutting edge being inclined toward said rearward end of the body as said end cutting edge approaches the axis of the body; and

shift preventing means for preventing said throw-away tip from being shifted during a cutting operation of the end mill, said shift preventing means comprising an engaging recess formed in one of the bottom face of the tip receiving recess and the lower surfce of the throw-away tip and extending axially of the body and a projection complementary to said engaging recess of the shift preventing means and formed on the other of the bottom face of the tip receiving recess and the lower surface of the throw-away tip so as to be brought into engagement with said engaging recess of the shift preventing means.

4,693,642

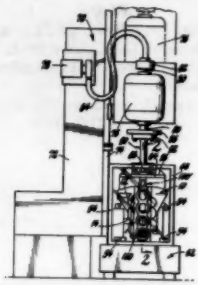
LINE BORING APPARATUS

Alexander C. Mair, Bloomfield Hills; Leonhard Allgaier, West Bloomfield, and Arnold O. DeHart, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 2, 1986, Ser. No. 881,345

Int. Cl.[4] B23B *41/12*

U.S. Cl. 408—59 4 Claims



1. Boring apparatus for workpieces which are characterized by a series of spaced walls to be bored on an axis comprising, a boring bar, a motorized spindle adapted to advance on its axis so as to present a remote one end of said boring bar serially along said workpiece axis, commencing adjacent one end of a workpiece, to each of the walls of such workpiece, a low pressure supply of boring coolant fluid, and a bar and coolant supply coupling joining the opposite end of said bar drivingly to said spindle and further to said coolant supply, said boring bar comprising at least one boring cutter element adjacent said one end thereof and a generally cylindrical hydrodynamic bearing adjacent the cutter element toward said opposite end of said bar, said bearing being sized closely to but less than the diameter of the bore cut by said cutter element whereby as said boring bar penetrates said spaced walls said bearing is adapted to utilize a cut surface of the workpiece as its outer bearing race under the dynamic pressure of coolant fluid resident at said bearing, and means for conveying fluid from said coolant fluid supply to said bearing.

4,693,643

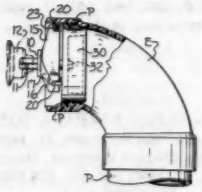
PLASTIC PIPE PLANING DEVICE

Malcolm I. Heyworth, Charlotte, N.C., assignor to E&A Heyworth Enterprises, Inc., Charlotte, N.C.

Filed May 20, 1986, Ser. No. 865,262

Int. Cl.[4] B23B *3/22, 41/00*

U.S. Cl. 408—82 9 Claims



1. A plastic pipe planing device for progressively planing or cutting the end of a plastic pipe, and for reaming out a piece of plastic pipe fixed in a plastic pipe fitting, said planing apparatus comprising

a rotatable hub,

elongate drive means having an inner end fixed to said hub,

and an outer end adapted to be drivingly connected to a portable electric drill for drivingly rotating said hub,

circumferentially spaced-apart spider-like cutter arms having inner ends fixed to said hub and extending radially outwardly therefrom, and outer ends terminating slightly radially inwardly of the outer diameter of the plastic pipe to be planed,

a cutter blade attached to the radial outer end portion of each of said cutter arms and including a lower planing or cutting edge and a radial outer edge perpendicular to said cutting edge, said radial outer edge extending radially outwardly and being flush with the outer diameter of the plastic pipe to be planed, and

a cylindrical pilot removably carried by and rotatable with said hub, said pilot including an outer circumference dimensioned to provide a snug rotatable fit within the end of the plastic pipe to be planed, and for centering said hub and said cutter arms relative to the plastic pipe, said cylindrical pilot including an upper planar surface engaging said lower cutting edges of said cutter blades.

4,693,644

ANNULAR HOLE CUTTER

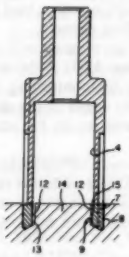
Shiro Takahashi, Tokyo, Japan, assignor to Man Design Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 589,416, Mar. 14, 1984, abandoned. This application Jun. 18, 1986, Ser. No. 875,456

Claims priority, application Japan, Mar. 14, 1983, 58-36494[U]

Int. Cl.[4] B23B *51/04*

U.S. Cl. 408—204 **3 Claims**



1. An annular hole cutter comprising:

a substantially cylindrical barrel (1) having an outer and inner circumferential surface (3, 4), and an upper end and a lower end, said outer and inner circumferential surfaces being concentric;

a shank (2) attached to the upper end of said barrel, the central axis of the outer and inner circumferential surfaces (3, 4) of the barrel being in concentric relationship with the central axis of said shank; and

a plurality of circumferentially equidistantly spaced cutting teeth (5) formed of hard material attached to said lower end of said barrel, said cutting teeth (5) including outer cutting edges (8) and inner cutting edges (9), said outer cutting edges having an outer circumference the central axis of which is in concentric axial relationship relative to the outer and inner circumferential surfaces (3, 4) of said barrel (1), said cutting teeth (5) having varying radial thickness so that a center of an imaginary circle circumscribed by the inner peripheries of the inner cutting edges (9) of said cutting teeth is offset a short radial distance from the central axis of the outer and inner circumferential surfaces (3, 4) of said barrel, the inner peripheral surfaces (12) of the upper portions of the inner cutting edges (9) of said cutting teeth where the teeth are secured to said cylindrical barrel (1) being flush with the inner circumferential surface (4) of said barrel, the inner cutting edges (9) of a plurality of relatively thick cutting teeth (5) projecting farther radially inwardly from the inner circumferential surface (4) of said barrel than inner cutting edges (9) of a plurality of relatively thin cutting teeth so that said inner cutting edges (9) of the relatively thick cutting teeth (5) are formed with steps (12*a*) between the inner peripheral surfaces of the lower portions of the inner cutting edges (9) and the inner peripheral surfaces (12) of the upper portions of the inner cutting edges (9), said steps (12*a*) having a width corresponding to said radial offset distance, whereby a gap (15) is formed between the inner peripheral surfaces (12) of the upper portions of the inner cutting edges (9) extending above said steps (12*a*) and a core (14) in a workpiece being cut by the inner cutting edges wherein the majority of chips formed by said cutting teeth are normally discharged from said annular hole cutter and a portion of the chips ascending along the inner circumference (4) enter into said gap (15) to avoid jamming of the chips.

4,693,645

THREE-DIMENSIONAL DUPLICATING MILLING MACHINE

Ingomar Kjeldsen, Conrad Holmbos veg 44, N-9000 Tromso, Norway

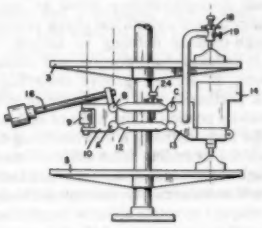
Filed Jun. 30, 1986, Ser. No. 880,274

Continuation of PCT No 85/00063 filed Oct. 7, 1985, published as WO 86/02864 on May 22, 1986.

Claims priority, application Norway, Nov. 5, 1984, 844378; PCT Int'l Appl., Oct. 7, 1985, PCT/NO85/00063

Int. Cl.[4] B23C *1/16*

U.S. Cl. 409—86 **7 Claims**



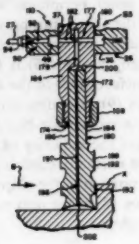
1. Centric three-dimensional duplicating milling-machine having a table (3) for the original and a cutting table (5), (4), counterweight bars (16), a milling-machine (14) with a cutter, a feeler and a coordinator arm connected between the feeler and milling machine, (17), characterized in that the table (3) for the original and the cutting table (5) are mounted on a column (1), and a combination arm (7) is mounted on the same column between the two tables and has an inner section (7^1) with a first articulation (6) and a second articulation (9), and an outer section (7^2) consisting of a cross-articulation bracket (10) where two horizontal pivots (A,B) are positioned vertically above each other and on which respectively an upper arm (11) and a lower arm (12) are pivoted in a vertical plane, and further, the other extremity of the upper arm (11) is pivoted in a vertical plane to a bracket (13) by means of a third pivot (C) while the other extremity of the lower are (12) is pivoted in a vertical plane to said bracket by means of a fourth pivot (D) while said bracket (13) comprises a clamp which holds the milling-machine (14).

4,693,646

APPARATUS FOR LUBRICATING A WORKPIECE

Mark J. Andrews, Niagara Falls, N.Y., assignor to Gemcor Engineering Corp., Buffalo, N.Y.

Filed Feb. 18, 1986, Ser. No. 829,923
Int. Cl.[4] B23C 1/00; B23B 51/06
U.S. Cl. 409—136 3 Claims



1. In combination with an automatic fastening machine for installing fasteners in a workpiece clamped between an upper head assembly and a lower ram assembly of said machine, apapratus for cutting the workpiece with a rotary cutting tool comprising:

(a) spindle-supporting means in said upper head assembly and including a collar portion having a body, said collar body defining a through-opening and a flow passage extending through said body to said through-opening, said spindle-supporting means further including a bearing retainer portion extending from said collar portion and having a through opening in communication with said collar through opening;

(b) a spindle supported by said spindle-supporting means and including a spindle body having a cylindrical shank portion closely positioned within said collar body through-opening and an end portion positioned within said bearing retainer through opening for rotation within and relative to said through-opening about an axis of rotation, the surfaces of said cylindrical shank portion and said collar through-opening defining an annular cavity encircling said cylindrical shank portion, said collar through opening defining an annular groove encircling said cylindrical shank portion so that the surface of said annular groove provides a portion of the walls of said annular cavity, said spindle body defining a tool-receiving end, a tool-receiving cavity extending from said tool-receiving end, and a passageway extending between said tool-receiving cavity and said annular cavity, said spindle body being elongated and adapted to rotate about is longitudinal axis relative to said collar, one portion of said passageway extending axially along said spindle body from said tool receiving cavity and another portion of said passageway extending radially of said one portion to said annular cavity;

(c) a cutting tool including an elongated body having a cutting portion and a holding portion extending therefrom, said holding portion operatively positioned within said tool-receiving cavity for rotation with said spindle, said cutting portion defining a cutting edge adapted to effect a cut as said cutting tool is rotated and moved into engagement with a workpiece, said tool body having a central passage extending longitudinally therealong, said passage having an entrance in the surface of said holding portion and an exit in the surface of said cutting portion adjacent said cutting edge so that fluid directed into said annular cavity through said flow passage travels a continuous path through said spindle passageway and cutting tool passage and out of said cutting tool at a location adjacent said cutting edge for lubricating the workpiece during a cutting operation;

(d) bearing means retained in said through opening of said bearing retainer portion of said spindle supporting means for rotatably mounting said spindle in said spindle supporting means;

(e) first sealing means between said cylindrical shank portion of said spindle body and said collar body adjacent the side of said annular cavity facing said bearing means for preventing fluid from contacting said bearing means; and

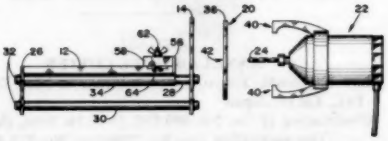
(f) second sealing means between said cylindrical shank portion of said spindle body and said collar body adjacent the opposite side of said annular cavity for preventing loss of said fluid.

4,693,647

MULTI-TOOL DOWEL HOLE DRILLING MACHINE

Sherwood D. Marx, 6478 S. M St., Tacoma, Wash. 98408

Filed Nov. 6, 1985, Ser. No. 795,328
Int. Cl.[4] B23C 9/00; B23Q 5/22
U.S. Cl. 409—163 3 Claims



1. A high speed dowel hole drilling machine comprising:

a work table for supporting a workpiece;

a tool plate oriented perpendicularly to the work table, said tool plate having a tool plate drill opening extending between opposing surfaces of said plate;

a high-speed rotary machine tool having

a rotating drilling element,

a drive means for rotating said drilling element at a speed between about 5,000 RPM and 30,000 RPM,

control means for controlling the drive means so as to determine the speed of the drilling element, and

non-rotary frame means for attachment of said machine tool;

tool mounting means for removably attaching said machine tool to the tool plate such that the drilling element extends perpendicularly through the drill opening of said tool plate toward the work table, said tool mounting means including

tool adaptor means for removably attaching any one of several different high-speed rotary machine tools to the tool plate, and

plate mounting means for adjustably attaching the tool adaptor means together with the machine tool to the tool plate so that rotation of said tool adaptor means about an axis oriented perpendicularly to the plane of the tool plate and intersecting a side portion thereof raises or lowers the drilling element relative to an upper surface of the work table;

carriage means for supporting the work table while allowing said work table to be translated perpendicularly toward and away from the tool plate; and

support means for supporting the carriage means and the tool plate upon a horizontal work surface such as a workbench.

4,693,648

DEPTH OF CUT ADJUSTING MECHANISM

Robert P. Cavedo, Easley, S.C., assignor to The Singer Company, Stamford, Conn.

Filed Jun. 19, 1986, Ser. No. 876,042
Int. Cl.[4] B27C 1/10
U.S. Cl. 409—178 3 Claims

1. In a power planer having a frame including a platen having an underside defining a plane of support for said planer, a cutter supported adjacent said platen and arranged to cut in the

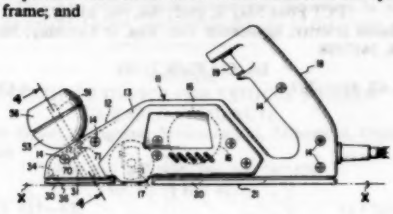
plane defined by the underside of said platen, and a depth of cut adjusting mechanism comprising;

an infeed shoe having a planar undersurface arranged at the opposite side of said cutter from said platen;

means shiftably supporting said infeed shoe on said planer frame in said undersurface parallel to the plane defined by said platen;

spring means arranged between said planer frame and said infeed shoe biasing the undersurface of said infeed shoe upwardly toward a position above the plane defined by said platen underside;

an operator influenced knob constrained on said planer frame; and



abutment means limiting the spring biased position of said infeed shoe and including an interengaging cam and cam follower means associated one with said infeed shoe and the other with said operator influenced knob;

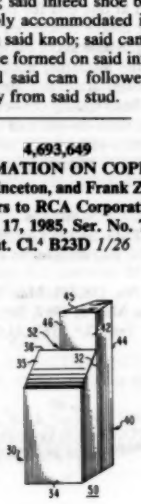
said operator influenced knob being constrained on said planer frame by a bearing supporting said knob for rotation about an axis inclined with respect to the plane defined by said platen underside and preventing axial movement of said knob; said infeed shoe being formed with a bore; a stud slidably accommodated in said bore and secured coaxially on said knob; said cam means comprising a spiral cam surface formed on said infeed shoe surrounding said bore; and said cam follower comprising a pin projecting laterally from said stud.

4,693,649

SHARP EDGE FORMATION ON COPPER HEATSINKS

Robert E. Harwood, Princeton, and Frank Z. Hawrylo, Trenton, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed May 17, 1985, Ser. No. 735,163
Int. Cl.[4] B23D *1/26*
U.S. Cl. 409—293 **6 Claims**



1. A cutting apparatus for imparting a sharp, defect-free corner of a desired angle to a metal workpiece comprising:

a first cutting tool having an inclined first surface bounded by a first cutting edge which removes metal in a first cutting direction; and

a second cutting tool having an inclined second surface bounded by a second cutting edge which removes material in a second cutting direction;

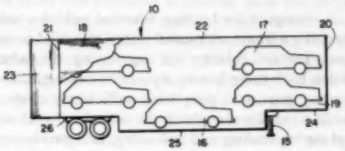
wherein said first cutting tool and said second cutting tool are held juxtaposed such that said first cutting edge and said second cutting edge contact and intersect to form an inside corner of the desired angle, thereby orienting said first cutting direction to be opposite to said second cutting direction.

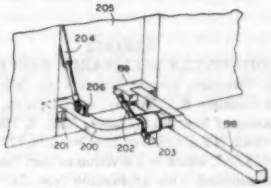
4,693,650

TRAILER APPARATUS FOR TRANSPORTING VEHICLES AND OTHER CARGO

Earl D. Smith, 2 Colonia Miramonte, Scottsdale, Ariz. 85253

Continuation of Ser. No. 519,388, Aug. 1, 1983, Pat. No. 4,597,712. This application Apr. 1, 1986, Ser. No. 846,883
Int. Cl.[4] B60P *3/07*
U.S. Cl. 410—18 **10 Claims**





1. A trailer apparatus for receiving and transporting wheeled vehicles, said wheeled vehicles having removable lifting members attached thereto and configured for engaging and supporting the wheels of said vehicles, said lifting members being attached to said wheeled vehicles prior to being received in said trailer apparatus, said trailer apparatus further being for receiving and transporting other cargo, said trailer apparatus comprising:

an enclosed body including first and second opposed side walls, a floor, a top, a front wall, and a rear wall, defining an interior storage volume, said rear wall including door means for providing access to the interior storage volume of said body;

wheel means connected with said body for carrying said body along a support surface;

vehicle support means mounted within said body for supporting several vehicles within said body, said support means including:

(a) a first plurality of support members connected with the first side wall of said body, and

(b) a second plurality of support members connected with the second side wall of said body,

each support member having means for permitting alternate disposition of the support member in:

(1) a stowed orientation in which the support member is disposed substantially without invasion of the interior storage volume of said body, and

(2) an extended orientation in which the support member extends inwardly into the interior storage volume of said body,

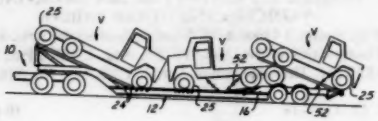
the support members, when in the extended orientation, being configured for cooperatively receiving and supporting said lifting members attached to vehicles received within said body.

4,693,651

TRAILER WITH SPECIAL RAMPS

Gerald W. Stuart, Pontiac, Mich., assignor to Traffic Transport Engineering, Inc., Romulus, Mich.

Filed Sep. 2, 1986, Ser. No. 902,634
Int. Cl.[4] B60P *1/00*
U.S. Cl. 410—30 7 Claims



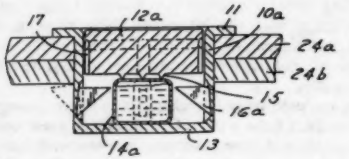
1. A transport for hauling wheeled vehicles, said transport comprising a frame, elongated ramps mounted on said frame in spaced, parallel relation for supporting the wheels of said vehicles, each ramp having a plurality of longitudinally spaced transverse pins, said pins being sufficiently close together to provide a track over which the wheels of said vehicles may travel during loading and unloading, said pins being removable so that selected pins may be removed to provide pockets to receive said wheels for transit.

4,693,652

ADHESIVELY SECURABLE FASTENER

Theodore J. Sweeney, Grosse Pointe City, Mich., assignor to Theodore Sweeney & Company, Inc., Detroit, Mich.

Continuation of Ser. No. 472,084, Mar. 4, 1983, Pat. No. 4,555,206, which is a division of Ser. No. 234,777, Feb. 11, 1981, Pat. No. 4,425,065, which is a division of Ser. No. 936,331, Aug. 24, 1978, abandoned. This application Nov. 21, 1985, Ser. No. 800,555
Int. Cl.[4] F16B *13/04, 39/02*
U.S. Cl. 411—23 13 Claims



1.

An adhesively securable fastener for securing a first substrate having top and bottom portions to a second substrate having top and bottom portions through aligned apertures therein comprising:

a. an elongated body having an opening and a top portion and further having deflectable tabs opening adjacent to and towards the second substrate at a position juxtaposed to the opening;

the body capable of protruding through the apertures in the substrates with the body top portion capable of contacting the top portion of the first substrate and the deflectable tabs capable of contacting the bottom portion of the second substrate;

b. an adhesive positioned within said body; and

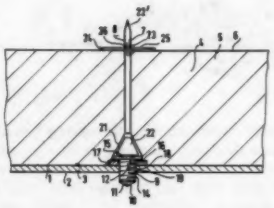
c. registering with the opening of the body a plunger means for applying pressure to said adhesive thereby adhesively securing the fastener to the substrates by movement of at least a portion of the adhesive from the body to the substrate and the deflectable tabs having the ability to lock the bottom portion of the second substrate to it so as to be able to fasten together the body and the substrate.

4,693,653

MOUNTING ELEMENT FOR A FLAT INSULATING BODY WHICH CAN BE ATTACHED TO A THIN-WALLED BASE

Rainer Schubert, Liebigstrasse 38, and Otto Weber, Hubertusstrasse 144, both of D - 4620 Castrop-Rauxel, Fed. Rep. of Germany, assignors to Vereinigte Schraubenwerke GmbH, Essen; Rainer Schubert and Otto Weber, both of Castrop-Rauxel, all of, Fed. Rep. of Germany

PCT No. PCT/DE85/00153, § 371 Date Jan. 8, 1986, § 102(e) Date Jan. 8, 1986, PCT Pub. No. WO85/05165, PCT Pub. Date Nov. 21, 1985
PCT Filed May 9, 1985, Ser. No. 834,273
Claims priority, application Fed. Rep. of Germany, May 9, 1984, 3417108
Int. Cl.[4] F16B *25/00*
U.S. Cl. 411—387 4 Claims



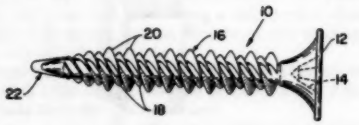
1. In a mounting element for mounting a flat insulating material on a thin-walled base, said mounting element including a pin conformed at one end for perforating the insulating material and having means connected to the other endof the pin for attaching to the base and a clamping plate for clamping to the pin, to hold the insulating material on the pin, the improvement wherein the attaching means comprises a screw having a shaft and a head fixedly connected to the shaft and the other end of the pin, with the pin and shaft in axial alignment, wherein the shaft has a self-cutting thread and a drill tip and wherein the head has key engaging faces for driving by a drill.

4,693,654

SELF-DRILLING, SELF-TAPPING FASTENER

John E. Bettini, Elgin, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation of Ser. No. 128,211, Mar. 7, 1980, abandoned. This application May 3, 1982, Ser. No. 374,353
Int. Cl.[4] F16B *25/00*
U.S. Cl. 411—387 7 Claims



1. A self-drilling, self-tapping screw comprising a head with drive-engageable surfaces at one end; a drill point at the opposite end; and a threaded region intermediate said two ends; said drill point including a first conical segment with a flat side and a rounded tip, the edges of the flat side of said first conical segment creating a pair of cutting edges diverging from a continuously curved rounded tip at a relatively sharp acute angle, the cutting edges extending for a predetermined axial distance along the screw length, said first conical segment being at a first longitudinal position along the screw length, a second conical segment with a flat side and a rounded tip, said second conical segment being at a second longitudinal position along the screw length, said second longitudinal position being

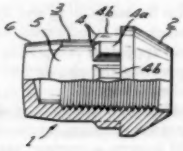
nearer the head than said first position and at least a portion of the two flat sides being coplanar, the entire surfaces of each conical segment being smooth, the flat side of the second conical segment being coplanar with the flat side of the first conical segment and defining a pair of side edges diverging from the rounded tip of said second conical segment at a relatively sharp acute angle, the side edges of said second conical segment being spaced radially inwardly from associated cutting edges on said first conical segment creating a pair of flat side segments radially inwardly of said cutting edges for a substantial portion of said predetermined axial distance, the axially transverse dimension of the drill point in a longitudinal plane intersecting the cutting edges at any given location being greater than any other axially transverse dimension in any other longitudinal plane intersecting the axis of the screw.

4,693,655

ANTI-THEFT DEVICE FOR VEHICLE WHEELS (GEARED OVAL NUT)

Shigeru Omori, Unagidani Mishinomachi, Minamiku, Osaka, Japan

Filed Aug. 20, 1985, Ser. No. 767,498
Int. Cl.[4] F16B *41/00*
U.S. Cl. 411—429 **11 Claims**



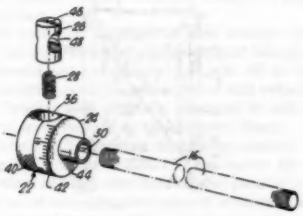
1. An anti-theft lug nut which includes:
a column section having:
(a) a plurality of protrusions on the periphery of said column section said protrusions being trapezoidal in cross-section, and at least one of said trapezoidal protrusions having a different cross-section than the remainder of said trapezoidal protrusions, at least one of said trapezoidal protrusions having side-bearing walls for torquing and untorquing of said lug nut; and
(b) a modified cylindrical section adjacent said protrusions, said modified cylindrical section, when viewed in cross-section, having at leat one portion of the cross-section of different diameter than the diameter of the remainder of said modified cylindrical section.

4,693,656

QUICK ADJUSTING NUT

Gerald Guthrie, Stillwater, Minn., assignor to 5W Enterprises, Inc., Stillwater, Minn.

Filed Sep. 1, 1983, Ser. No. 528,576
Int. Cl.[4] F16B *37/08*
U.S. Cl. 411—433 **6 Claims**



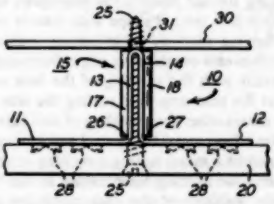
1. A quickly adjustable stop nut assembly for use on a cylindrical threaded shaft of a milling machine, drill press or similar machine to provide a positive stop for relative motion between portions of the machine, which cylindrical threaded shaft has a predetermined major diameter, said stop nut assembly comprising, in combination:
a body having a generally cylindrical peripheral surface portion, having a through axial passageway including cylindrical portions slightly larger than the major diameter of the shaft to closely receive the shaft while affording free movement of the body axially along the shaft, and having a transverse cylindrical socket extending generally radially into said body, said transverse socket intersecting said axial passageway and opening through the cylindrical peripheral surface portion of said body:
a cylindrical plunger disposed in said socket, said plunger having an outer end manually accessible from the periphery of said body, an inner end portion disposed within said body, and an axis extending between said outer end and end portion, said plunger also having a transverse through aperture which has an inner portion partially defined by threads adjacent the inner end portion of said plunger adapted for engagement with the threads of the shaft, and has an outer portion adjacent the outer end of said plunger affording free transverse movement of the plunger axially along the shaft, said plunger being movable within said socket between a released position with the outer portion of said aperture aligned with said passageway to afford axial movement of said nut assembly along the shaft, to an engaged position with the threads on said plunger engaging with threads on the shaft, said outer end of said plunger being generally aligned with said peripheral surface portion of said body when the plunger is in said engaged position; and
biasing means between the said plunger and said body for biasing said plunger to said engaged position;
said aperture being elongate axially of the plunger and said threads adjacent the inner end of said plunger being adapted for about 180 degree engagement with the threads on the shaft to lock said nut assembly against longitudinal movement on the shaft without relative rotation therebetween when said plunger is moved to said engaged position under the influence of said biasing means; and
said body having a plurality of graduation marks about said generally cylindrical peripheral surface portion to facilitate fine rotational adjustment of the position of said nut assembly along the shaft when said plunger is in said engaged position.

4,693,657

AUTOMOTIVE PANEL BRACKET

Dick T. VanManen, Canandaigua, NY., assignor to Voplex Corporation, Pittsford, N.Y.

Filed Mar. 31, 1986, Ser. No. 846,199
Int. Cl.[4] F16B *15/00*
U.S. Cl. 411—467 **16 Claims**



1. An automotive bracket comprising:
a. a central region of a flat strip being bent back on itself at

a fold line to form a double-walled stand-off with parallel and confronting walls;

b. a groove formed in each wall of said stand-off, each of said grooves being parallel with and in between side edges of said strip to extend along the length of said stand-off, said grooves being arranged to confront each other and closely surround a generally cylindrical pilot hole for receiving a fastener extending through said stand-off;

c. base portions of said bracket extending in a plane from each of said stand-off walls, said base portions being adapted to engage and interlock with an automotive panel so that said stand-off bridges a distance between said panel and an automotive body;

d. said grooves being cut off at said fold line of said stand-off for opening a fold line end of said pilot hole between said grooves; and

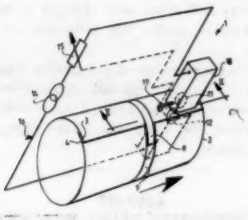
e. cutouts in each of said base portions adjacent said grooves for opening a base end of said pilot hole between said grooves.

4,693,658

METHOD OF MANUFACTURING A CONTAINER BODY HAVING A TEAR STRIP, THE BODY PER SE, AND A METAL BLANK FROM WHICH THE BODY IS TO BE MANUFACTURED

Johannes A. Glerum, Am Deventer, and Robert C. Klunder, Aw Twello, both of Netherlands, assignors to Thomassen & Drijver-Verblifa NV, De venter, Netherlands

Filed Jun. 18, 1985, Ser. No. 746,127
Int. Cl.[4] B21D *51/26;* **B23K** *11/06;* **B65D** *17/36*
U.S. Cl. 413—1 **7 Claims**



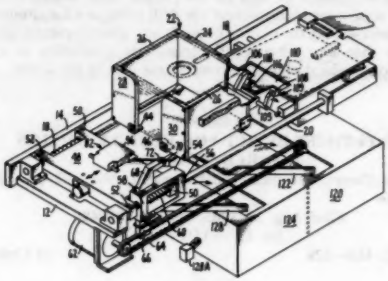
1. A method of forming a container body having an integral tear strip to facilitate opening of the container and wherein the container has a welded side seam, said method comprising the steps of providing a sheet metal blank formed of a base metal and having formed therein the tear strip, shaping the sheet metal blank to a tubular shape with remote edges of the blank in overlapping relation, progressively welding together said base metal in said overlapping edges from one end of the blank to the other with the welding of the base metal being interrupted at the tear strip, and sealing the side seam at the tear strip by means other than welding of said base metal, said sheet metal blank base metal being steel and having an overall coating formed of a metal having a melting temperature which is lower than the melting temperature of the base metal of the blank, the welding of the base metal being interrupted by reducing welding intensity to one wherein only melting of the coating will occur at the tear strip along the side seam, and the melted coating forming the means other than welding of said base metal which seals the side seam at the tear strip.

4,693,659

DISKETTE TRANSPORT

Ken V. Burke, Ben Lomond; Jon V. Jamieson, San Jose, and Ernie Keller, Sunnyvale, all of Calif., assignors to Mountain Computer, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 526,670, Aug. 26, 1983, abandoned.
This application Jun. 11, 1985, Ser. No. 743,530
Int. Cl.[4] G11B *17/10*
U.S. Cl. 414—131 **6 Claims**



1. An apparatus for singulating and feeding diskettes one at a time from a stack and transporting each diskette to a disk drive station, said apppartus comprising:

means for supporting the plurality of diskettes in a vertical stack including a hopper,

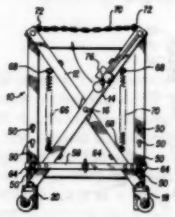
means for pushing the bottommost diskette in the stack from beneath the stack including a pair of spaced rails disposed beneath said hopper, a carriage plate mounted for travel along said rails, means mounted to said carriage plate for separating the bottommost diskette from the stack and pushing said diskette from under the stack as the carriage plate moves beneath the stack along said rails, a chain drive extending in a direction parallel to said rails, said carriage plate being operatively connected to said chain drive, means for operating said chain drive and moving said carriage plate along said rails, and further comprising a lost motion connection including a spring operatively connected between said carriage plate and said chain drive, said spring allowing said chain drive to operate without advancing said carriage plate if carriage plate movement is obstructed.

4,693,660

SCISSOR LIFT AND TRANSPORT

Lloyd A. LaCroix, P.O. Box 905, 313 2nd St., Lawrenceburg, Tenn. 38464

Filed Dec. 24, 1985, Ser. No. 813,092
Int. Cl.[4] B60P *3/00*
U.S. Cl. 414—458 **5 Claims**



1. A load lifting and transporting mechanism comprising two cross frame members and having upper ends and lower ends,

a pair of wheels supporting the cross frame members,
a winch mounted on the frame members,
a cable one one end of which is attached to the winch,
the two cross frame members having a pivoted intersection forming an X-shaped configuration,
the winch being positioned in the upper end of one cross member,
a first pulley journaled in the upper end of the second cross member,
a second pulley journaled in the lower end of the second cross member,
a third pulley.
A flexible cable secured at one end to the lower end of the first cross member then trained over the third pulley, second and first pulleys in that order and affixed at another end to the winch, which when turned, draws in the cable causing the upper ends of the cross members to move toward each other and the lower ends to do likewise raising the height of the upper ends,
one support including a flange adapted to engage a load, the support being mounted on each of the upper ends of the cross frame members and the supports so defined with the load being raised with the upper ends,
a horizontal frame member having an open interior enclosing and being slidable about the lower ends of the cross frame members, and
the horizontal frame member having end portions attached at each of the end portions thereof to one of the supports to properly distance the supports.

4,693,661

CONNECTING ELEVATOR

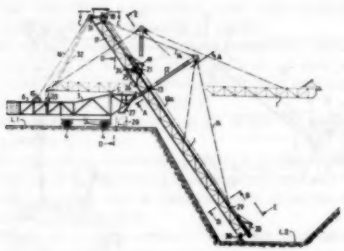
Reinhard Trümper, Ratekau, and Robert Baschant, Lübeck, both of Fed. Rep. of Germany, assignors to O & K Orenstein & Koppel AG, Fed. Rep. of Germany

Continuation of Ser. No. 570,498, Jan. 13, 1984, abandoned. This application Sep. 19, 1986, Ser. No. 910,267

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1983, 3303059

Int. Cl.[4] B65G *47/58, 41/00, 17/02*

U.S. Cl. 414—595 **3 Claims**



1. A mine material elevator for operation on benches at different levels of a mine, comprising:
a crawler vehicle adapted to be positioned on a higher one of the benches;
a support frame (3) mounted on said vehicle, said support frame having a horizontal pivot support bearing (7) at one end thereof and a counterweight arm (6) on an opposite end thereof extending outwardly of said vehicle;
a swing bracket (37) pivotally mounted at said horizontal pivot support bearing to said support frame;
rollers rotatably mounted to said swing bracket;
an elongated support structure (1) mounted for rolling on said rollers of said swing bracket and parallel to a longitudinal axis of said elongated support structure for pivotally and displaceably connecting said elongated support structure to said support frame, said elongated support structure having a first end which is positionable on a lower one of the benches when said support structure is pivoted on said frame, said support structure having a second end on an opposite side thereof from said first end;
a pair of side by side rail trackways (9) extending along a top surface of said support structure from said first end toward said second end;
a back-up rail (23) extending along said trackways;
a cargo carrying vessel (19, 20) movable along said trackways, each vessel includes a hinged bottom and a back-up roller connected to each hinged bottom and engaged with said back-up rail for holding each hinged bottom closed;
a chute (26) connected to said support structure between said second end thereof and said swing bracket;
interruption means connected to each back-up rail for interrupting each back-up rail in the vicinity of said chute for opening said hinged bottom of each vessel above said chute for depositing contents of each vessel into said chute, said interruption means comprising each back-up rail having a movably mounted rail length (25) and a hydraulic mechanism (24) operatively connected to each rail length for moving each length away from a remainder of its respective back-up rail (23);
at least one first winch connected to said support structure at said second end thereof;
a hoisting rope connected to each of said vessels and operatively connected to said one first winch for raising and lowering said vessels along their trackways;
a second winch (15) connected on said counterweight arm adjacent said opposite end of said support frame;
a winch cable operatively connected between said second winch and said second end of said support structure for lowering and raising said second end of said support structure to raise and lower said first end of said support structure as said swing bracket pivots on said horizontal pivot support bearing;
a counterweight connected to said counterweight arm at said opposite ends of said support frame for counterweighting said support structure; and
a hoist mechanism (38) connected between said support structure and said swing bracket for moving said support structure parallel to its longitudinal axis and along said swing bracket.

4,693,662

COMPACT EXCAVATOR

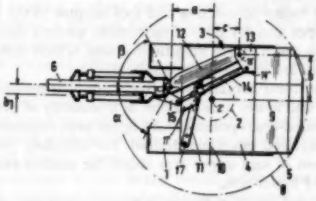
Luis Haringer, Neumarkt, Italy, assignor to Macmoter S.p.A, Modigliana, Italy

Filed Sep. 25, 1985, Ser. No. 780,968

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1984, 3435981

Int. Cl.[4] E02F *3/38*

U.S. Cl. 414—695 **9 Claims**



1. A compact excavator, comprising a chassis (1), a superstructure (3), and swivel journal means (2) for securing said superstructure (3) to said chassis (1), said swivel journal means defining a vertical axis (2') through which a transverse axis (10) extends horizontally across the excavator and perpendicularly to a normal forward travel direction of the excavator, a boom (6) for carrying excavator means, parallel guide means for

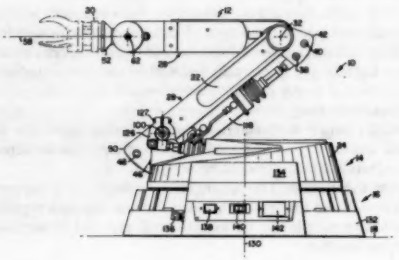
directly securing said boom to said superstructure (3), said parallel guide means comprising a fixed length member (12) and a parallelogram link (14, 14') arranged to extend substantially in a common horizontal plane with said fixed length member (12), first vertically extending means for pivotally connecting forward ends of said fixed length member (12) and of said parallelogram link (14, 14') to said boom, and second vertically extending journal means (13' and 14'') located at a location at least as far rearwardly as said transverse axis (10) when said superstructure (3) has its front end aligned substantially in parallel with, and facing in the same direction as, a front end of said chassis, said second vertically extending journal means directly journalling rearward ends of said fixed length member (12) and of said parallelogram link (14, 14') to said superstructure at said location at least as far rearwardly as said transverse axis (10) for an increased mobility and stability of said boom (6).

4,693,663

ROBOT WITH ARTICULATED ARM

David L. Brenholt; Stephen M. Crane; Paul M. Fischer, and Kenneth V. Mattson, all of Menomonie, Wis., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Oct. 5, 1984, Ser. No. 658,267
Int. Cl.[4] B25J 9/06
U.S. Cl. 414—735 7 Claims



1. A robot with a mechanically programmable operating envelope, which comprises:

a base plate;

a lower arm having an inner end connected to said base plate for pivotal movement about a first transverse axis, and an outer end;

an upper arm having an inner end connected to the outer end of said lower arm for pivotal movement about a second transverse axis generally parallel to the first axis, and an outer end;

a tool adaptor;

wrist means connecting said tool adaptor to the outer of said upper arm for pivotal movement about a third transverse axis and a fourth longitudinal axis, which third and fourth axes are mutually perpendicular;

a first linear actuator selectively coupled between one point in said lower arm and one of a plurality of predetermined spaced-apart points in said upper arm, depending upon the operating envelope desired, for effecting pivotal movement of said upper arm about the second axis relative to said lower arm;

a second linear actuator selectively coupled between one point in said base plate and one of a plurality of predetermined spaced-apart points in said lower arm, depending upon the operating envelope desired, for effecting pivotal movement of said lower arm about the first axis relative to said base plate;

pantograph means extending about the first, second and third transverse axes and interconnecting said lower arm, said upper arm, and said wrist means for maintaining substantially constant orientation of said adaptor upon pivotal movement of said lower and upper arms about said first and second transverse axes, respectively; and

third and fourth linear actuators connected between said base plate and said pantograph means for independently effecting pivotal movement of said adaptor about the third and fourth axes, respectively;

said pantograph means comprising:

a pair of first rollers mounted for independent rotation about the first transverse axis;

a pair of cranks, each crank adjustably secured to one of said first rollers, one crank being coupled to said third linear actuator and the other crank being coupled to the fourth linear actuator;

a pair of second rollers mounted for independent rotation about the second transverse axis;

a pair of first endless belts interconnecting corresponding first and second rollers;

a pair of third rollers mounted for independent rotation about the second transverse axis, each third roller being secured for rotation with the corresponding second roller;

a pair of fourth rollers coupled to said wrist means and mounted for independent rotation about the third transverse axis; and

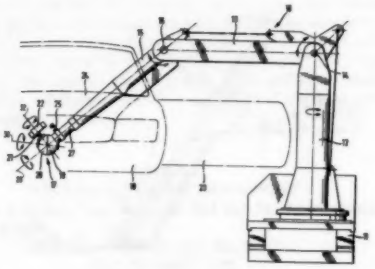
a pair of second endless belts interconnecting corresponding third and fourth rollers.

4,693,664

PROGRAM-CONTROLLED INDUSTRY ROBOT IN PARTICULAR LAQUERING (OR PAINTING) ROBOT

Werner Schweiker, Gemmrigheim, Fed. Rep. of Germany, assignor to Hermann Behr & Sohn GmbH & Co., Ingersheim, Fed. Rep. of Germany

Filed Aug. 6, 1984, Ser. No. 638,032
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1983, 8322699
Int. Cl.[4] B25J 17/02, 18/04
U.S. Cl. 414—735 2 Claims



1. A program-controlled industry robot for the treatment of work pieces having movable parts (24) to be moved prior to the treatment, said robot comprising; a support arm (15) having a female end portion, means (12,13) supporting said arm whereby said arm is swivelable three dimensionally, a support arm end part (27) having a longitudinal axis (28) and being telescopically mounted in said female end portion and rotatably mounted about said longitudinal axis (28) and having a free end (19), a swivel head (17) mounted on the free end (19) of said support arm end part (27), said swivel head (17) having a first part (20) rotatable about a second axis (30) and a third part rotatable about a third axis (32), said second (30) and third (32) axis being nonparallel and intersetting with said first axis (28), a support member (25) movable with said support arm (15), and characterized by said support member (25) being affixed rigidly and directly on said support arm end part (27) and rotatable therewith for lifting of the movable part (24) of

the work piece so that the forces acting on said support member (25) act directly on said support arm (15) and do not place any loads on said second (30) or third (32) axes of said swivel head (17).

4,693,665

LARGE FORCE MULTI-AXIS MANIPULATING ARM UNIT, ESPECIALLY FOR USE AS AN INDUSTRIAL ROBOT

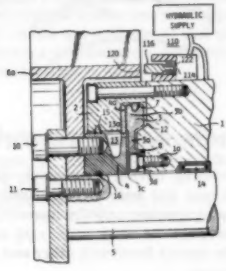
Karl-Heinz Friederichs, Kiel, and Günther Twiefel, Flintbek, both of Fed. Rep. of Germany, assignors to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany

Filed Apr. 9, 1984, Ser. No. 598,519

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1983, 3312862

Int. Cl.[4] B25J 9/06

U.S. Cl. 414—744 R **16 Claims**



1. A multi-axis manipulating arm unit in the form of an articulated industrial robot arm having a high force generating means for generating a high force about one axis of said multi-axis unit;

said robot arm having a plurality of arm elements, at least two adjacent arm elements being disposed along different but connected longitudinal axes, said at least two arm elements being connected at a joint;

said joint having a drive system comprising an actuator for providing movement about an axis of said joint and a braking and locking arrangement, said braking and locking arrangement comprising:

first braking means comprising a device for stopping movement at said joint;

second braking means comprising a hydraulically operated brake for hydraulically applying braking force for braking and stopping said at least two arm elements about their corresponding joint;

said second braking means for applying force being substantially free of play about said joint when actuated for locking said at least two arm elements substantially rigidly with respect to one another such that forces are transmittable through said joint, which exceed many times the forces required to lock said plurality of arm elements substantially rigidly against the force of gravity and which exceed by many times the braking forces provided by said first braking means when said first braking means is actuated;

said first braking means and said second braking means both including means for permitting said adjacent arm elements to move substantially freely relative to each other when the braking force of both said brake means is deactuated;

said first braking means having portions;

said second braking means having portions;

said first braking means being disposed at said joint;

some of said portions of said first braking means being disposed on and directly attached to one of said adjacent arm elements, and some of said portions of said first braking means being disposed on and directly attached to the other of said adjacent arm elements to act directly upon said portions of said one of said adjacent arm elements;

said second braking means being disposed at said joint and a first of said portions of said second braking means being disposed on and directly attached to one of said arm elements for rotating with one of said adjacent arm elements, and a second of said portions of said second braking means being disposed on and directly attached to the other of said adjacent arm elements to act directly upon said portions of said one of said adjacent arm elements;

said means of said second braking means for permitting said adjacent arms to move substantially freely comprising flexible means;

said second braking means having at least a first braking surface means and at least a second braking surface means;

said flexible means having said first braking surface means attached thereto, said flexible means being firmly attached to said first of said portions of said second braking means;

said second braking surface means being disposed on and firmly attached to said second of said portions of said second braking means;

said flexible means for making braking contact and withdrawing braking contact between said first braking surface means and said second braking surface means;

actuator means for actuating and deactuating said flexible means by flexing said flexible means to make braking contact and withdrawing said braking contact between said first braking surface means and said second braking surface means;

said flexible means being flexible in one direction to make said braking contact and withdrawing said braking contact and being substantially rigid in a direction other than said one direction;

said flexible means being disposed such that said rigid direction is disposed in a direction of rotation of said adjacent arm elements, whereby there is no substantial play between said first and said second of said portions of said second braking means when said second braking means is actuated and also whereby, there is no substantial play between said adjacent arm elements when said second braking means is actuated;

said flexible means of said second braking means includes a brake piston made in the form of a circular braking element, having an axially elastic but rotationally stiff portion and said first braking surface means with a friction surface disposed thereon;

said actuator means comprising a hydraulic volume adjacent said brake piston for admitting hydraulic oil under pressure to flex said elastic portion and move said friction surface means thereon; and

said second braking surface means having a friction surface and being disposed on a disc element adjacent said circular braking element;

said second braking surface means comprising an annular element having a friction surface adjacent a side of said disc element opposite said brake piston;

said annular element being connected to rotate with said brake piston;

said disc element being axially elastic but rotationally stiff so that a pressure from said brake piston urges another friction surface of said disc element against said friction surface of said annular element;

said friction surface of said brake piston being disposed to transmit a frictional torque, without substantial play, to said adjacent disc element which is freely rotatable relative to said friction surfaces when the second braking means is not actuated;

said friction surfaces of said braking surface means of said brake piston and said disc element are full circumferential ringshaped braking surfaces;

said multi-axis manipulating arm unit comprising a plurality of joints and a plurality of drive systems, at least some of said joints being rotary joints.

4,693,666

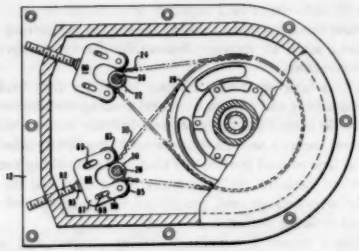
SCARA TYPE MANIPULATOR APPARATUS

John Garin, Mt. Lebanon, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 635,375, Jul. 27, 1984, abandoned. This application Jul. 31, 1986, Ser. No. 892,890

Int. Cl.[4] B25J *9/06*

U.S. Cl. 414—744 R 2 Claims



2. A robotic manipulator apparatus comprising:

a base supporting first and second independently operable drive means;

a primary arm rotatably supported by said base and means coupling said primary arm to said first drive means for driving said primary arm from said first drive means for rotation through one planar space;

a secondary arm having one end rotatably carried by the end of said primary arm opposite said base for rotation through another planar space, translationally displaced from said first planar space;

means coupling said second drive means to drive said secondary arm independently of said primary arm, said coupling means extending from said base through said first arm to said one end of said secondary arm;

each of said first and second independently operable drive means including a drive motor means having a first toothed gear affixed to the drive shaft, each of said means for coupling including a second toothed gear, a first endless toothed belt means operatively coupling the toothed gears for rotating said primary arm in response to the drive motor means of said first operable drive means, a second endless toothed belt means operatively coupling the toothed gears for rotating said secondary arm in response to the drive motor means of said second operable means, and

first and second adjustably positioned bidirectional belt tensioning means operatively associated with said first and second toothed belt means to control the tension of each of said belts,

each of said adjustably positioned bidirectional belt tensioning means including;

a U-shaped support member having first and second rotatable roller means affixed to at either end of said U-shaped support member, said U-shaped support member being slidably positioned relative to said first toothed gear such that said first toothed gear is located within the open end of said U-shaped support member, said first and second rotatable roller means contacting the external surface of said endless toothed belt means on either side of said first tooth gear, wherein both said first and second rotatable roller means contacting the external surface of said endless tooth belt means exert simultaneously increasing or decreasing tension on said belt means, and

adjustment means coupled to said U-shaped support member to position said U-shaped support member relative to said first toothed gear for simultaneously positioning said first and second rotatable roller means to control the tension of said endless tooth belt means.

4,693,667

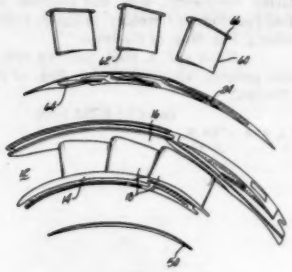
TURBINE INLET NOZZLE WITH COOLING MEANS

Herman N. Lenz, Lambertville, Mich., and Allen G. Chen, Sylvania, Ohio, assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 144,909, Apr. 29, 1980, abandoned. This application Jun. 22, 1982, Ser. No. 390,872

Int. Cl.[4] F01D *5/14*

U.S. Cl. 415—115 9 Claims



1. For use in a turbine engine, a turbine nozzle assembly comprising:

a housing, said housing having an annular outer shroud having an inlet axial end and an outlet axial end, and a plurality of vanes extending radially inwardly from said outer shroud between its axial ends, said vanes being circumferentially spaced from each other and disposed in a turbine gas stream,

a tubular and cylindrical impingement plate positioned coaxially around the outer shroud so that at least a portion of the plate is spaced radially outwardly from said outer shroud thus forming a chamber therebetween, said plate having a plurality of apertures formed through it,

means for sealingly and fixedly attaching one axial end of the impingement plate to the inlet end of said outer shroud and for sealingly and fixedly attaching the other axial end of the impingement plate to the outlet end of said outer shroud,

fluid passage means formed between said chamber and the turbine gas stream,

means for communicating a pressurized cooling fluid to the outer periphery of the outer shroud, and

wherein said impingement plate includes means intermediate its ends for permitting axial differential thermal growth between said impingement plate and said outer shroud while minimizing thermal stress between said impingement plate and said outer shroud.

4,693,668

TURBINE HOUSING OF TURBOCHARGER

Takaaki Koike, Hachioji, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1986, Ser. No. 865,358

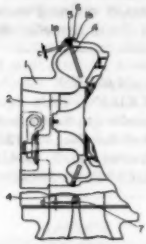
Claims priority, application Japan, May 29, 1985, 60-80233[U]

Int. Cl.[4] F28F *7/00*

U.S. Cl. 415—138 1 Claim

1. A turbine housing of a turbocharger of the type in which an interior of a turbine housing main body is partitioned into a plurality of paths, comprising: a turbine housing main body divided into a plurality of sections in axial direction of the turbine, mated engaging grooves formed in an inner circumferential direction at opposing surfaces of the divided sections of said turbine housing, a partition wall fitted into said engaging grooves, leaving a clearance in radial direction of the turbine, said partition wall having side surfaces, and a partition wall

supporting member which integrally joins opposing surfaces of said divided sections of said turbine housing main body and which is disposed in said turbine housing main body such that said partition wall supporting member is in coplanar relation-



ship with a flange surface of said turbine housing main body at a gas inlet and contacts at least one side surface of said partition wall, so as to ensure gas-tightness at said gas inlet in gas flow direction, leaving a predetermined clearance in circumferential direction of said partition wall.

4,693,669

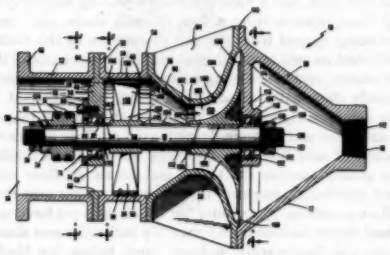
SUPERCHARGER FOR AUTOMOBILE ENGINES

Leroy K. Rogers, Sr., Rte. 13, P.O. Box 815-DD, Briarcliff Rd., Fort Myers, Fla. 33908

Filed Mar. 29, 1985, Ser. No. 717,652

Int. Cl.[4] F04D *17/02, 29/40*

U.S. Cl. 415—143 **7 Claims**



3. A supercharger comprising:

a housing having a longitudinal axis and being constructed from sections, which sections are connected in end-to-end relationship, said sections including a front housing section defining an axially directed inlet, an axial compressor duct section for housing an axial compressor, a rear housing section downstream of said axial compressor duct section and an exhaust section having a hollow, highly convergent, frustoconical, exhaust cone portion downstream of said rear housing section, a downstream portion of said rear housing section defining a cylindrical, axially directed inlet for a radial compressor, a casing for a radial compressor, and a substantially radially directed outlet for a radial compressor, said rear housing section further defining a highly convergent, hollow, frustoconical transition duct between a downstream end of said axial compressor duct section and said radial compressor inlet, said rear housing section having interior surfaces for defining a flow deflector, which flow deflector receives the output of said outlet for a radial compressor, which flow deflector provides a smooth surface transition from said rear housing section into said exhaust section, said exhaust cone portion defining at a downstream end a coaxial outlet, said housing further including at least two bearing supports affixable within said housing according to predetermined locations along said longitudinal axis of the housing, said bearing mounts rotatably supporting a compressor shaft, which compressor shaft is positioned along said longitudinal axis;

bearing assemblies removably implaced in said bearing supports, said bearing assemblies receiving said compressor shaft;

an axial compressor located within said axial compressor duct and secured to said shaft to be rotatable therewith, said axial compressor drawing a flow from said inlet of the front housing section and imparting an initial compression to said flow;

a radial compressor located within said casing and secured to said shaft to be rotatable therewith, said casing being in a substantially sealing relationship with said radial compressor, said radial compressor including a hub, a first set of blades extending radially from said hub and having leading edges at an intake region of said radial compressor and a second set of blades extending radially from said hub and having leading edges downstream of said intake region, said radial compressor further compressing said flow;

at least one pulley wheel secured to said compressor shaft and adapted to receive drive belts;

spacers fitted upon said compressor shaft for axially positioning said axial compressor and said radial compressor relative to each other; and

means for securing said compressor shaft against axial displacement;

wherein said transition duct favorably directs the output of the axial compressor into said inlet of the radial compressor and said exhaust cone section encloses sufficient volume to moderate the output of said radial compressor.

4,693,670

ADJUSTING DEVICE FOR AN AIRPLANE PROPULSION SYSTEM

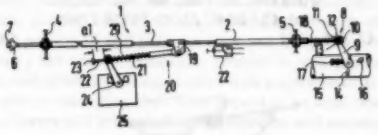
Juergen Hawener, Stuttgart, and Klaus Hain, Leonberg, both of Fed. Rep. of Germany, assignors to Dr. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 30, 1986, Ser. No. 824,281

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1985, 3503951

Int. Cl.[4] B63H *3/10*

U.S. Cl. 416—25 **14 Claims**



1. Adjusting apparatus for an airplane propulsion system of the type having a reciprocating piston combustion engine with an adjustable intake throttle valve and with a propeller pitch regulator; the improvement comprising: a throttle valve, a propeller pitch regulator, said adjusting apparatus comprising:

movable connecting rod means linked to the throttle valve via a pivot joint means and movably guided in and with respect to a relatively fixed rod casing means,

throttle valve spring means fixed to the rod casing means and biasing the connecting rod pivot joint means toward an open throttle position,

manually releasable blocking means for selectively blocking movement of the connecting rod means with respect to the fixed rod casing means, and

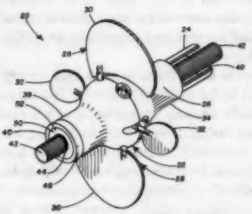
carrying rod means connected to the connecting rod means and a control member of the propeller pitch regulator via the interposition of a pitch regulator spring means therebetween.

4,693,671

REVERSIBLE SELF-ADJUSTING PROPELLER DEVICE

Harold C. Thornton, Jr., Oak Ridge, and Clifton W. Hall, Knoxville, both of Tenn., assignors to Tramtec Corporation, Oak Ridge, Tenn.

Filed Aug. 28, 1986, Ser. No. 901,891
Int. Cl.[4] B63H *3/00*
U.S. Cl. 416—43 **9 Claims**



1. A self-adjusting propeller device for transmitting forces to and from a fluid, comprising:

a thrust blade having a thrust blade area;

a control blade having a control blade area that is less than the blade area of said thrust blade;

a hub supporting said thrust and control blades for rotation in the fluid about a hub axis so that said thrust and control blades transmit forces to the fluid as they are rotated about the hub axis with the force transmitted being proportional to the pitch of each ;

means for interconnecting said thrust and control blades so that in response to a changing load on the device, said thrust and control blades move in relation to said hub axis with said thrust blade moving in relation to said hub axis at a changing pitch with the change in pitch of said thrust blade being proportional to the change in the load; and

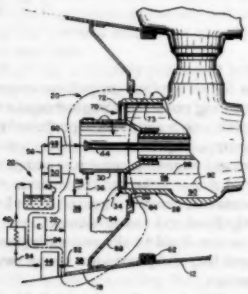
means for changing the pitch of said control blade to selected pitch settings.

4,693,672

TWO LEVEL OIL DAM

Paul A. Carvalho, Westfield, Mass., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 30, 1986, Ser. No. 925,050
Int. Cl.[4] B64C *11/30*; F01M *11/00*
U.S. Cl. 416—174 **6 Claims**



1. Apparatus for draining a centrifuged band of oil from a rotating propeller shaft and for damming a pool of oil if the propeller shaft is not rotating, comprising:

first means for damming said pool of oil and having disposed therein a first draining means for draining said band, said first means for damming being mounted to said propeller shaft;

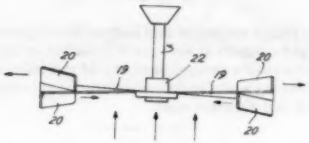
second means for damming said pool of oil and having a second draining means for draining said band disposed therein, said second means for damming being mounted to said propeller shaft such that both of said first draining means and said second draining means are not below surface of said pool if said propeller shaft is not rotating.

4,693,673

CEILING FAN

Victor W. Nee, 1624 Arcadia St., South Bend, Ind. 46635

Continuation-in-part of Ser. No. 406,123, Aug. 9, 1982, abandoned. This application Sep. 5, 1984, Ser. No. 647,393
Int. Cl.[4] F04D *29/38*
U.S. Cl. 416—199 **2 Claims**



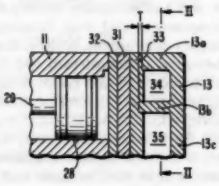
1. In combination, a ceiling fan having a plurality of radially extending blades mounted to rotate about a vertical axis, and means for rotating said fan in selected direction, said blades being shaped and positioned to discharge air upwardly from said blades when rotated in one direction and to discharge air downwardly from said blades upon rotation thereof in the opposite direction, and a vane portion projecting angularly in selected fixed relation from a face of each blade, said vane portions being spaced from the axis of rotation of the blades and positioned on said blades to provide rotative balance of the fan as it rotates, said vanes being positioned to extend similarly substantially diagonally of said blades and being shaped to generate substantially radial air flow in direction and magnitude to intercept and commingle with axial air flow generated by rotation of said blades and thereby produce a favorable pressure gradient across the blades and create air flow with moderate distribution intensity throughout a greater area than the air flow produced by a similar fan which does not have said vanes, said blades include both forwardly inclined vanes above the blades and backwardly inclined vanes below the blades when said blades are rotated in one direction.

4,693,674

CYLINDER HEAD FOR REFRIGERANT COMPRESSOR

Isamu Fukai, Fujioka, and Katsumasa Azami, Isesaki, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Feb. 26, 1986, Ser. No. 832,876
Claims priority, application Japan, Feb. 26, 1985, 60-25399[U]
Int. Cl.[4] F04B *39/12*
U.S. Cl. 417—269 **6 Claims**



1. A cylinder head for fluid compressor, said cylinder head

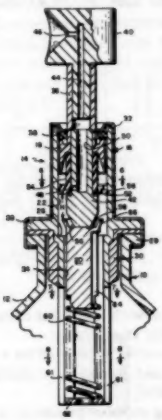
comprising an end plate portion with an outer wall portion and an inner partition wall portion extending from said end plate portion and defining a suction chamber and a discharge chamber, said wall portions including end surfaces disposed in parallel planes spaced from and opposed to said end plate portion with the plane of the end surface of said inner partition wall portion being disposed from said end plate portion approximately 0.02 mm to 0.08 mm greater than the plane of the end surface of said outer wall portion, means disposed about the perimeter of said cylinder head for fasteniing the same to a cylinder block through a valve plate adapted to close said suction chamber and said discharge chamber and having ports opening into the same and gasket means interposed between said end surfaces and said valve plate, whereby said end surfaces are in sealing engagement with said gasket.

4,693,675

NON-THROTTLING DISCHARGE PUMP

Frank Venus, Jr., Merrimack, N.H., assignor to The Pharmasol Corporation, South Easton, Mass.

Filed Jan. 16, 1986, Ser. No. 819,529
Int. Cl.[4] G01F *11/06*
U.S. Cl. 417—489 **8 Claims**



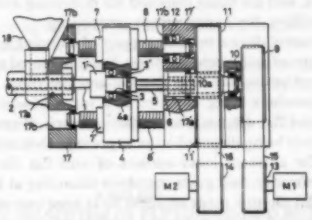
1. A discharge pump for expelling fluid from a container comprising a housing defining aligned large diameter and smaller diameter chambers wherein the adjacent ends of the chambers define an annular shoulder, first and second plungers disposed, respectively, in said large and smaller diameter chambers for reciprocal movement in unison and for movement relative to each other, spring means engaged with said second plunger in said smaller chamber yieldably holding said second plunger extended from said smaller chamber into abutting engagement with said first plunger in said larger chamber, said first plunger being of larger cross section than the second plunger, a discharge passage in said first plunger, sealing means mounted to said first plunger over said discharge passage, an intake passage in said second plunger providing communication between said container and said larger diameter chamber when said second plunger is held extended from said smaller diameter chamber into said larger diameter chamber, sealing means at the end of said second plunger engaged with said first plunger operable when said second plunger is displaced from said larger diameter chamber into said smaller diameter chamber to close the intake passage from the smaller diameter chamber into the larger diameter chamber and said first plunger and sealing means associated therewith being normally movable following movement of said sealing means mounted to said second plunger to close the intake passage to, in succession, displace said second plunger relative to said first plunger and thereafter move said first sealing means associated with the first plunger by engagement with said shoulder relative to said discharge passage to uncover the same and said spring means being operable thereafter to successively move said second plunger from said smaller chamber into said larger chamber and disengage said sealing means associated with the first plunger from said shoulder such as to allow said sealing means associated with the first plunger to cover said discharge passage.

4,693,676

SCREW-ROTATING/INJECTION MECHANISM OF INJECTION MOLDING MACHINE

Yoshiharu Inaba, Kawasaki, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP85/00382, § 371 Date Mar. 6, 1986, § 102(e) Date Mar. 6, 1986, PCT Pub. No. WO86/00562, PCT Pub. Date Jan. 30, 1986
PCT Filed Jul. 5, 1985, Ser. No. 841,523
Claims priority, application Japan, Jul. 7, 1984, 59-139753
Int. Cl.[4] B29C *45/77*
U.S. Cl. 425—145 **4 Claims**



1. A screw-rotating/injection mechanism for use in an injection molding machine, comprising:

a screw shaft having a front end and a rear end, said front end having a screw formed thereon;

a drive shaft fixed to the rear end of said screw shaft and disposed in axial alignment with said screw shaft;

a pressure plate for rotatably supporting said drive shaft, said pressure plate having a central portion and a peripheral portion thereof, said drive shaft extending through the central portion of said pressure plate and being disposed rotatably but axially immovable relative to said presure plate, said drive shaft being formed with a spline shaft at a rear side of said drive shaft with respect to an axial position wherein said drive shaft is supported by said pressure plate;

a nut spline-coupled to said spline shaft;

a screw rotating motor;

a first transmission unit coupling said nut to said screw rotating motor;

a plurality of ball nuts disposed in the peripheral portion of said pressure plate in a manner unrotatable relative to said pressure plate;

a plurality of ball screws extending in parallel with said screw shaft and disposed circumferentially of said screw shaft at angular intervals, each of said ball screws having a rear end portion and arranged rotatably and threadably coupled to a corresponding one of said ball nuts, said pressure plate being supported by said ball screws in a manner axially movable relative to said ball screws;

an injection servo motor; and

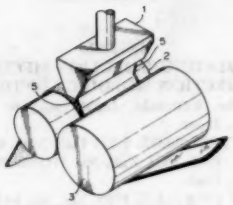
a second transmission unit coupling said injection servo motor to the rear end portion of each of said ball nuts, said ball nuts being driven simultaneously by said injection servo motor through said second transmission unit.

4,693,677

FLAT DIE NECK-IN CONTROL DEVICE

Hiromi Shigemoto; Akio Yamamoto, both of Iwakuni, and Iwatoshi Suzuki, Yamaguchi, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Apr. 23, 1986, Ser. No. 854,897
Claims priority, application Japan, Apr. 24, 1985, 60-88093
Int. Cl.[4] B29C *47/14, 47/32*
U.S. Cl. 425—376 R 5 Claims



1. In an extrusion and roll forming apparatus including resin extruder with a flat sheet-forming die and first and second rollers, said die being disposed for delivering extruded resin to said rollers, the improvement comprising:

a control device including a pair of inducing guide members, one of said guide members being mounted to a first longitudinal end of said flat die and the other of said guide members being mounted to a second longitudinal end of said flat die, an inner surface of each of said guide members being disposed so as to provide a smooth extension of the adjacent inner surface of said flat die of said resin extruder, said guide members extending at least from said flat die to a point adjacent to at least one of said first and second rollers, whereby, neck-in of the extruded resin is minimized.

4,693,678

MALE LAYUP-FEMALE MOLDING SYSTEM FOR FABRICATING REINFORCED COMPOSITE STRUCTURES

Arthur D. Von Volkli, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 15, 1986, Ser. No. 819,039
Int. Cl.[4] A01J *21/00*
U.S. Cl. 425—405 R 15 Claims

1. A molding system, comprising:

a layup support fixture;

a boot securable over the support fixture to define a layup surface for a prepreg structure and;

a female mold, having a plurality of sections sealingly interconnected and disassemblable to allow easy release of the cured structure from the female mold, the mold having a smooth inner surface corresponding to the desired exterior surface configuration of the structure;

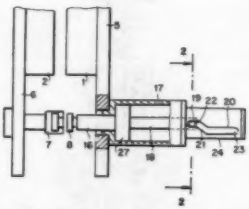
wherein the boot is sealingly securable to the female mold to define a cavity between the boot and mold for housing the structure during curing, and wherein the fixture, boot, and female mold allow layup of prepregs on the boot and curing of the prepreg structure thereafter in the female mold to yield a structure having an aerodynamically smooth outer surface formed to within close tolerance.

4,693,679

AUTOMATIC LATCH FOR MOLD CLOSING

Peter Marth, Konigswinter, Fed. Rep. of Germany, assignor to Mauser-Werke GmbH, Bruhl, Fed. Rep. of Germany

Filed Nov. 6, 1985, Ser. No. 795,690
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1984, 3440476
Int. Cl.[4] B29C *39/26, 45/26*
U.S. Cl. 425—589 6 Claims



1. A molding apparatus with means for coupling and locking two mold halves together comprising:

(a) a first coupling member supported by a mold holder for a first mold half and movable rotationally and axially relative to said holder;

(b) a second coupling member mounted to a second mold half and axially aligned with said first coupling member;

(c) a first locking formation on said first coupling member and a mating second locking formation formed on said second coupling member such that when said first and second locking formations are engaged they lock said first and second coupling members to one another when they are rotated to a first position and unlock when rotated to a second position; and

(d) piston actuator means for rotating and axially moving said first coupling member so that said first locking formation is rotated from said second position, wherein said mold halves are separated, to said first position, wherein said mold halves are closed together, and from said first position to said second position.

4,693,680

FLAME STABILIZED POST-MIXED BURNER

William J. Snyder, White Plains, and Hisashi Kobayashi, Putnam Valley, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 14, 1986, Ser. No. 896,211
Int. Cl.[4] F23M *3/04*
U.S. Cl. 431—10 18 Claims

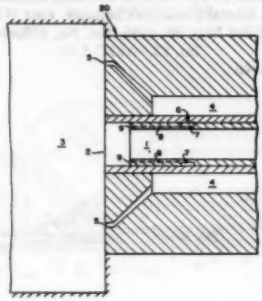
1. A post-mixed burner comprising:

(a) a fuel passage having an end for injecting fuel into a combustion zone;

(b) a main oxidant passage having at least one end for inject-

ing oxidant into the combustion zone and having a total area A_1 at the injection point(s), said end(s) being radially spaced from the fuel passage end; and

(c) a stabilizing oxidant passage communicating with both the fuel and main oxidant passages upstream of their respective ends, said stabilizing oxidant passage having a total area A_2 where it communicates with the fuel passage and a restriction having an area A_3 upstream of where it communicates with the fuel passage wherein the ratio $A_3/(A_1+A_3)$ is not more than 0.1 and the ratio A_3/A_2 is not more than 0.7.



4,693,681

CANDLE APPARATUS

Todd M. Comstock, Cotuit, Mass., assignor to Grand Royalties, Ltd., Mashpee, Mass.

Continuation-in-part of Ser. No. 604,896, Apr. 27, 1984, Pat. No. 4,608,011. This application Jul. 21, 1986, Ser. No. 887,354

Int. Cl.[4] F23D *3/18*

U.S. Cl. 431—324 **22 Claims**

1. A candle apparatus comprising;

a base having means defining a base opening formed at least in part by a peripheral wall,

a canister for containing a liquid that is to be burned,

said canister having cap means with a passage therethrough for receiving a wick which is adapted to extend into the liquid and also extend at least partially out of the canister,

said canister having a base adapted to be received in said base opening,

and a shell which is adapted to extend over said canister and base peripheral wall and having an opening defined in the top thereof so as to leave said cap means and wick exposed,

said base including a base member and integral platform extending upwardly from said base member, said platform being of a smaller diameter than said base member,

said peripheral wall being an annular wall that extends upwardly from said platform to define said base opening,

said base having, outwardly of the platform, a substantially flat shell resting surface,

said shell, about its bottom annular edge, resting upon the base flat surface, at its top, substantially co-terminous with the top of the cap means, and covering the platform, annular wall and canister.

11. A candle apparatus comprising;

a base having means defining a base opening formed at least in part by a peripheral wall,

a canister for containing a liquid that is to be burned,

said canister having cap means with a passage therethrough for receiving a wick which is adapted to extend into the liquid and also extend at least partially out of the canister,

said canister having a base adapted to be received in said base opening,

and a shell which is adapted to extend over said canister and base peripheral wall and having an opening defined in the top thereof so as to leave said cap means and wick exposed,

said shell having an upper inwardly directed annular flange defining the shell top opening,

said cap means having a top part of smaller diameter than the shell top opening and extending at least partially into said shell top opening,

the top of the cap means being substantially co-terminous with the shell flange.

4,693,682

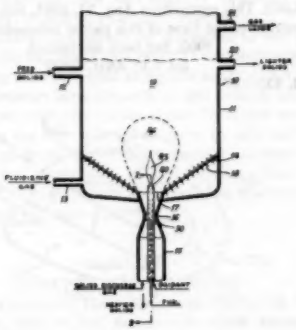
TREATMENT OF SOLIDS IN FLUIDIZED BED BURNER

Bernard S. Lee, Lincolnwood; Paul B. Tarman, Elmhurst, and Dharam V. Punwani, Bolingbrook, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed May 12, 1986, Ser. No. 862,325

Int. Cl.[4] F27B *15/00*; F23D *19/00*

U.S. Cl. 432—15 **15 Claims**



1. A process for thermal treatment of solid particles in a fluidized bed, said solid particles characterized by thermal treatment forming a lighter weight fraction and a heavier weight fraction, relative to the total contents of the bed, said process comprising:

feeding solid particles to a fluidized bed of solid particles, said fluidized bed supported on a bed support having at least one region of opposing downwardly sloping portions converging in thier lower portions into an opening of a density/size particle classification heavier particle dis-

charge conduit, said heavier particle discharge conduit having a necked region;

maintaining said fluidized bed of solid particles in fluidized condition by pressurized fluidizing gas entering said bed through a plurality of nozzle means in said bed support and pressurized solids discharge gas entering through said heavier particle discharge conduit controlling heavier particle passage therethrough;

maintaining a discrete fluid fueled flame in said fluidzied bed in close proximity to and above said opening of said heavier particle discharge conduit by feeding fuel and oxidant through a burner extending upwardly through the central portion of said heavier particle discharge conduit and having an outlet above said opening forming a higher temperature zone in and surrounding said flame, said higher temperature one at least about 100° F. higher than the remainder bed temperature;

circulating said solid particles in said fluidized bed through said higher temperature zone heating said particles to form said heavier weight particle fraction;

maintaining flow velocity of said solids discharge gas upwardly through an annular passage between said burner and said necked region of said heavier particle discharge conduit sufficiently high to permit downward passage of said heavier wieght particles for discharge while restraining from downward passage substantially all said ligher weight fraction and recirculating said lighter weight fraction through said higher temperature zone, and withdrawing said heavier weight particles through said heavier particle discharge conduit; and

withdrawing said lighter weight fraction from the upper region of said bed.

4,693,683

DENTAL APPARATUS AND METHOD OF USE

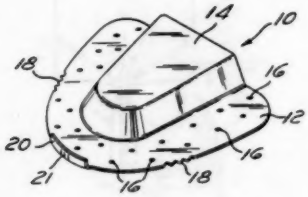
Robert L. Lee, 22937 Grand Terrace Rd., Colton, Calif. 92324

Continuation of Ser. No. 580,071, Feb. 14, 1984, Pat. No. 4,543,062. This application Aug. 12, 1985, Ser. No. 764,983

The portion of the term of this patent subsequent to Sep. 24, 2002, has been disclaimed.

Int. Cl.[4] A61C 9/00

U.S. Cl. 433—37 **6 Claims**



1. A dental check bite element comprising a tray shaped to fit within a person's mouth between the upper and lower teeth, the tray having a peripheral bite section to be engaged by the upper and lower teeth, said bite section being made of a thin material and having generally smooth lateral edges which curve towards the front of the tray to conform to a person's mouth, said lateral edges being interrupted to form means to facilitate gripping said edges with the thumb and a finger of one hand when inserting or withdrawing the tray from a patient's mouth.

4,693,684

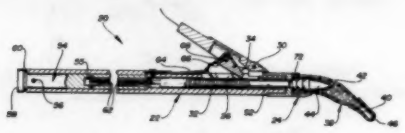
RATCHET TYPE DISPENSER FOR DENTAL MATERIALS

William J. Blatherwick, Hamilton Square; Leslie Hamilton, Trenton; Robert D. Holewinski, Lakehurst; Virginia A. Shen, East Brunswick, all of N.J.; Jeffrey Kapec, Westport, and Kazuna Tanaka, Cos Cob, both of Conn., assignors to Johnson & Johnson Dental Products Company, East Windsor, N.J.

Filed May 30, 1986, Ser. No. 868,494

Int. Cl.[4] A61C 5/04

U.S. Cl. 433—90 **3 Claims**



1. An applicator for dispensing predetermined quantities of paste-like material or fluid, which comprises, in combination:

a. an elongated hollow housing having a longitudinal axis, a front end and a top surface, said housing including an end wall at the front end, said end wall including a plunger guiding aperture therethrough, and nozzle receiving means in front of said end wall;

b. an opening in said housing in the top of surface thereof near the front end thereof, said opening communicating with the interior of the housing;

c. ratchet anchoring means within said housing;

d. ratchet means within said housing operatively attached to said anchoring means by spring means arranged and constructed to urge said ratchet means rearwardly toward a rest position, said ratchet means being accessible through said opening, said ratchet means including a plunger drive means at the front end thereof positioned to pass through the plunger guiding aperture;

e. a lever means positioned above said opening;

a drive pawl pivotably connected to said lever means;

lever spring means for biasing said drive pawl against said lever means;

detent pawl means fixed to said housing and extending over said opening to engage said ratchet means;

a portion of said lever spring means resting on said detent pawl means; and

f. nozzle means inserted in said nozzle receiving means, said nozzle means including a front discharge tip and a rear portion comprising a tubular body portion defining a reservoir for paste-like material or fluid, said tubular body portion including an open end at the rear thereof and a piston member therein, said nozzle means being inserted in said nozzle receiving means such that the open end including the piston member is alinged with said plunger guiding aperture;

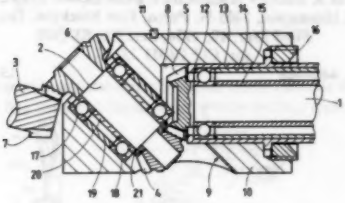
whereby when said lever is depressed, the ratchet is urged forward thereby forcing the plunger forward through the plunger guiding aperture and the plunger engages the piston and drives it forward to expel a predetermined amount of paste-like material or fluid contained therein out of said reservoir and into said discharge tip, and when said lever is elevated, the plunger withdraws from engagement with the piston and stops forcing the piston forward.

4,693,685

GEAR RATIO STEP-DOWN OR STEP-UP DEVICE FOR DENTAL HANDPIECE

Jacques Pernot, Geneuille, France, assignor to Micro-Mega S.A., Besancon, France

Filed Nov. 7, 1985, Ser. No. 795,999
Claims priority, application France, Nov. 7, 1984, 84 17335
Int. Cl.[4] A61C *1/08*
U.S. Cl. 433—105 **12 Claims**



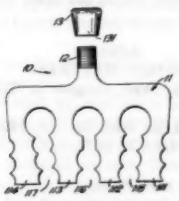
1. A gear-ratio adjusting device of a dental handpiece which is mounted between a tool driving shaft having a bevel wheel at one end thereof and a motor shaft, said device having a modular unit structure and comprising: a socket forcibly fitted into a handle of the dental handpiece, said socket having means defining an axial bore longitudinally extending in the socket, and means defining an oblique through-bore extending obliquely relative to the axial bore in the socket and being open at the periphery of the socket; and input shaft coaxial with and driven by said motor shaft and having a bevel wheel at one end thereof; and an oblique shaft inclined relative to said input shaft and to the tool driving shaft, said oblique shaft being provided at the ends thereof with a pair of bevel pinions meshing with the bevel wheel fixed to said input shaft and with the bevel wheel fixed to the tool driving shaft respectively, said input shaft being rotatably mounted in the axial bore of the socket, said oblique shaft being rotatably mounted in the oblique through-bore formed in said socket.

4,693,686

MAGNETIC DENTAL IMPLANT RETENTION SYSTEM

Victor I. Sendax, Suite 14B, 30 Central Park South, New York, N.Y. 10019

Filed Feb. 14, 1986, Ser. No. 829,725
Int. Cl.[4] A61C *8/00*
U.S. Cl. 433—173 **5 Claims**



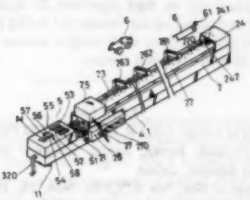
1. A dental prosthesis comprising:
a. an implant having an upper neck portion;
b. a ferromagnetic casted coping comprising a precious metal alloy;
c. a prosthetic member having a gum facing side;
d. a rare-earth magnet fixedly mounted in the prosthetic member at the gum facing side and coactive with the coping for retaining the prosthetic member in place;
e. a titanium abutment having a height of 2 to 4 mm, the abutment disposed between the coping and the implant, the abutment being cemented to the coping; and
f. a screw means disposed within the abutment and implant for connecting the abutment and implant to the coping.

4,693,687

APPARATUS FOR DETERMINING THE ACCELERATION OF A MOVING OBJECT UNDER GRAVITY

Ming-Chuen Hwang, No. 1-4, Lane 240, Chung San Road, Shan Hua Chen Tainan Hsien, Taiwan

Filed Mar. 14, 1986, Ser. No. 839,734
Int. Cl.[4] G09B *23/08*
U.S. Cl. 434—302 **16 Claims**



1. An improved apparatus for determing the acceleration of a moving object under gravity comprising:
an elongated hollow base;
an angle-adjustable slope body with a top track way, pivotally connected to said base through a pivot about which said slope body turns to change its angle of inclination;
at least three sensors movably provided in an orderly manner above said top track way for sending a signal when said moving object passes therethrough;
means for driving said angle adjustable slope body to a predetermined angle relative to said elongated base for sliding said moving object down to pass said three sensors;
a display means to show said angle of inclination of said slope body, including a turnable indicator;
a gear mechanism cooperatively connected to said pivot to transmit the motion of said pivot to said indicator;
an indicating ruler provided along said top track for measuring the distance between each of said sensors; and
a timer means responsive to the signals from said sensors for measuring the time interval required by said moving object to pass from one of said sensors to another sensor, wherein the acceleration of said moving object can be computed from each said corresponding distance of said sensors and said time intervals.

4,693,688

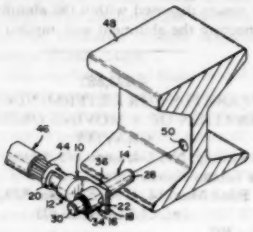
GROUNDING CONNECTOR

Bronislau J. Cembruch, Havertown, and Walter M. Werner, Downington, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 14, 1986, Ser. No. 885,065
Int. Cl.[4] H01R *4/10*
U.S. Cl. 439—877 **5 Claims**

1. A grounding connector for use in grounding a rail or other structure having a hole therein, said connector comprising:
conductive terminal means having receiving means at one end for receiving a grounding cable and apertured tongue means at another end; and
elongated conductive rod means having tapered pin means

at one end for being driven into the hole in the rail or other structure and securing means adjacent another end for securing said terminal means to said rod means, said securing means including a knurled portion thereon for



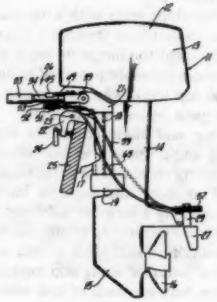
being received in said aperture in said tongue means, further including collar means for being pressed onto said knurled portion over said tongue means to lock said rod means to said terminal means.

4,693,689

CONTROLLING GEAR FOR OUTBOARD ENGINE

Norimichi Harada, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 671,733, Nov. 15, 1984, abandoned. This application Mar. 28, 1986, Ser. No. 846,468
Claims priority, application Japan, Nov. 30, 1983, 58-224478
Int. Cl.[4] B63H *21/26*
U.S. Cl. 440—51 **5 Claims**



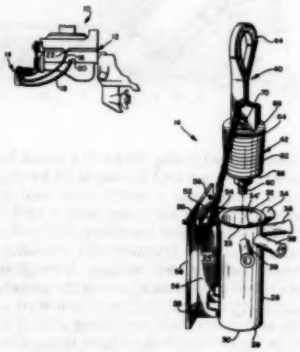
1. In a steering arrangement for a marine outboard drive adapted to be affixed to the transom of an associated watercraft for steering movement about a generally vertically extending steering axis and carrying driven propulsion means at its lower end, a trim tab pivotally carried by said outboard drive about an axis parallel to and rearwardly of said steering axis and adapted to be submerged in operation, and a steering lever extending forwardly from said outboard drive from said steering axis in a longitudinal direction and operably connected to said outboard drive for controlling steering movement about said steering axis, the improvement comprising means for pivoting said trim tab about its pivotal axis in a direction in response to steering movement of said steering lever in an opposite direction for generating a hydrodynamic force from said trim tab upon said outboard drive tending to steer said outboard drive in the direction of movement of said steering lever comprising a pair of flexible transmitters each affixed at one end to opposite sides of the steering lever forwardly of said steering axis and each having a portion extending from its point of operative connection longitudinally relative to the outboard drive to said steering axis, said steering lever being connected to said outboard drive by means including a lost motion connection defining a pivotal axis for said steering lever, a drum fixed relative to the outboard motor and supported for pivotal movement about a drum axis parallel to the pivotal axis of the steering lever and the axis of pivotal movement of the trim tab and means for rotating said drum about said drum axis upon relative movement of the steering lever relative to the outboard drive as afforded by the lost motion connection.

4,693,690

QUICK DRAIN ASSEMBLY FOR BOAT ENGINE

Elvin J. Henderson, 1407 N. Pecos, Fort Stockton, Tex. 79735

Filed Mar. 10, 1986, Ser. No. 837,958
Int. Cl.[4] B63H *21/38*
U.S. Cl. 440—88 **15 Claims**



1. A quick drain apparatus for draining water from an engine block of a boat engine, comprising:

a main cylindrical housing having an axial passageway formed therethrough; a packer device removably received within said main housing, said packer device has a packer element which is expandable into sealed relationship respective to the inner wall surface of the main housing, said packer element is retractable into a reduced diameter releasable configuration which enables the packer device to be removed from said main housing;

a plurality of lateral tubes each having a near end opposed to a far end, with the near end of each said lateral tube being affixed to the wall surface of the main housing with the far end of each said lateral tube extending away from said main housing; a passageway formed through each lateral tube and into said main housing;

said near end of each said lateral tube being located adjacent to one end of said main housing at a location which is covered by said packer element when said packer element is sealingly received within said main housing.

4,693,691

FLOAT MATTRESS

Jay DeYoe, Gold Hill, Oreg., assignor to HIS, Inc., Medford, Oreg.

Filed Jul. 26, 1985, Ser. No. 759,407
Int. Cl.[4] B63C *9/10*
U.S. Cl. 441—129 **7 Claims**

1. A float mattress comprising:

chunks of granular, buoyant material; and

bag means comprising a meshed fabric having openings smaller in size than the size of the chunks of granular material for containing the chunks of granular material while allowing water and air to pass freely through the fabric, the bag means being substantially and loosely filled with the granular material to provide a mattress that is longitudinally and laterally flexible,

the mattress being sized and shaped to support a person resting thereon while the mattress floats in water, the

mattress being stabilized by water freely passable through the bag means to displace air within the bag means.

4,693,692

APPARATUS FOR MANUFACTURING SMALL-SIZE GAS-FILLED LAMPS

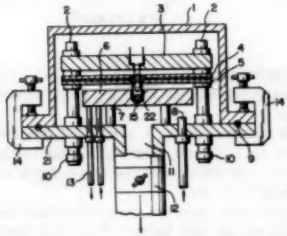
Jitsuo Hamai, Tokyo, Japan, assignor to Hamai Electric Lamp Co., Ltd., Tokyo, Japan

Division of Ser. No. 568,850, Jan. 6, 1984, Pat. No. 4,627,824. This application Aug. 20, 1986, Ser. No. 898,290

Claims priority, application Japan, Jan. 12, 1983, 58-3872; Jan. 12, 1983, 58-3874; Jan. 12, 1983, 58-3875; Jan. 12, 1983, 58-3876; Jan. 12, 1983, 58-3880

Int. Cl.[4] H01J *9/18, 9/38*

U.S. Cl. 445—66 **3 Claims**



1. An apparatus for manufacturing at least one gas-filled lamp from an assembly of a bulb having a closed head and an open end, and a bead disposed in the open end of the bulb and supporting a pair of lead wires with a filament connected thereto, said apparatus comprising:

(a) a base;

(b) a chamber mounted on said base;

(c) a bulb holder jig disposed on said base and housed in said chamber and having a recess for receiving the closed end of the bulb;

(d) a lead wire holder disposed in said chamber for supporting the lead wires;

(e) a heating carbon jig disposed in said chamber bewteen said lead wire holder and said bulb holder jig for holding the open end of the bulb with the bead positioned therein;

(f) electrodes mounted in said chamber and electrically connected to said heating carbon jig for supplying an electric current to said heating carbon jig to heat the latter;

(g) a gas supply tube mounted on said base for introducing a gas to be filled in the bulb into said chamber;

(h) an air outlet tube mounted on said base for developing a vacuum in said chamber; and

(i) coolant liquid tubes mounted on said base for supplying a coolant liquid to said bulb holder jig.

4,693,693

TOY CRASH VEHICLE

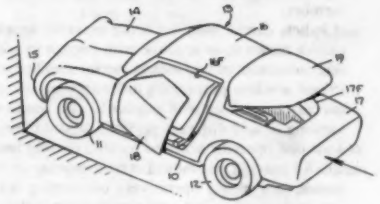
Melvin R. Kennedy, New York, N.Y.; Dietmar Nagel, Chester, N.J., and Abraham A. Arad, Westport, Conn., assignors to Buddy L Corporation, New York, N.Y.

Division of Ser. No. 707,567, Mar. 4, 1985, Pat. No. 4,588,386. This application Oct. 3, 1985, Ser. No. 783,357

The portion of the term of this patent subsequent to May 13, 2003, has been disclaimed.

Int. Cl.[4] A63H *17/02*

U.S. Cl. 446—6 **3 Claims**



1. In a toy vehicle, a hollow body supported above a chassis, said body being constituted by a front section having a normal shape simulating that of an engine hood integral with a main body portion, said main body portion being formed of rigid plastic material and being attached to the chassis, said front section being free of the chassis and being formed of resilient synthetic plastic material which has said normal shape, said resilient material having a memory such that when the front section is subjected to frontal pressure, it is deformd to simulate the effect of a crash, and when the deforming pressure is released, it resumes its normal shape, said vehicle further including a sled joined to the front end of the front section and slidable over the chassis, said pressure being applied to said sled upon frontal impact of said vehicle.

4,693,694

TOY WITH MOVING SCREEN

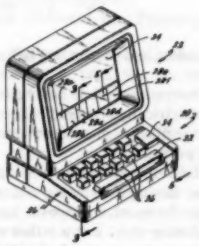
Yoshizo Seki, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 665,101, Oct. 26, 1984, Pat. No. 4,573,928. This application Feb. 26, 1986, Ser. No. 833,816

Claims priority, application Japan, Dec. 10, 1983, 58-190812[U]

Int. Cl.[4] A63H *33/30*; G09B *3/02*

U.S. Cl. 446—197 **16 Claims**



1. A toy which comprises:

a housing;

a viewing window located in said housing;

an indicia carrier member, said indicia carrier member located in said housing, indicia located on said indicia carrier member, said indicia carrier member located in associ-

ation with said window whereby at least a portion of said indicia is viewable through said window;

a lenticular screen, said lenticular screen located in association with said window and said indicia carrier member so as to be positioned in front of said viewable portion of said indicia;

means for moving said lenticular screen with respect to said indicia carrier member, said movement of said lenticular screen with respect to said indicia carrier member changing the perceived view of said viewable portion of said indicia;

carrier means for movably supporting said indicia carrier member;

said indicia carrier member being movably located on said carrier means so as to move with respect to said window, said movement of said indicia carrier member with respect to said window positioning different portions of said indicia carrier member with respect to said window allowing viewing of said different portions of said indicia strip;

at least one operator actuator located on said housing;

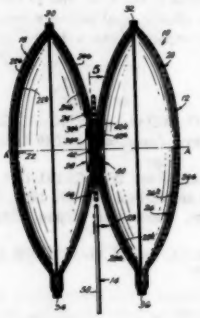
means for moving said indicia carrier member on said carrier means, said means operatively connecting between said operator actuator and said carrier means whereby movement of said operator actuator is transmitted to said carrier means to move said indicia carrier member with respect to said window.

4,693,695

ASCENDING AND DESCENDING BALLOON ACTION TOY

Peter S. C. Cheng, 5 Ross Street, Toronto, Ontario, Canada M5T 1Z8

Filed Mar. 31, 1986, Ser. No. 846,055
Int. Cl.[4] A63H *27/10*
U.S. Cl. 446—220 **9 Claims**



1. An ascending and descending balloon action toy, comprising:

(a) an air-buoyant envelope having an attached pair of mutually symmetrically arranged balloon portions, each having an interior filled with a lighter-than-air gas at about atmospheric pressure;

(b) a spool defining an axis between the balloon portions; and

(c) a tether having a fastening end region operatively connected to the spool, an opposite handle end region held by a user during play, and a tether region intermediate the end regions and repeatably coilable around, and uncoilable from, the spool during play,

(i) said tether region uncoiling from the spool about the axis when the envelope is released by the user into the air so as to enable ascent of the envelope,

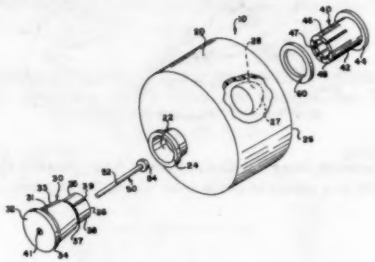
(ii) said tether region coiling around the spool about the axis when the handle end region is yanked by the user so as to cause descent of the envelope.

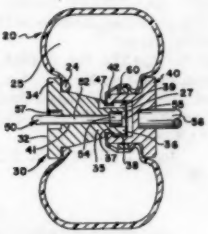
4,693,696

INFLATED BALLOON TIRE FOR TOY VEHICLES

Gordon H. Buck, 3784 Newton St., Torrance, Calif. 90505

Filed Jan. 27, 1986, Ser. No. 822,787
Int. Cl.[4] A63H *306, 17/00;* **B60B** *9/00, 21/10*
U.S. Cl. 446—224 **24 Claims**





1. A toy tire assembly comprising:

(a) an elastomeric balloon having a single central opening at one end;

(b) a hub member having a peripheral rim about one end, with its opposite end received in said balloon and with said single central opening of said balloon seated against said peripheral rim;

(c) a cap member received over the outside surface of the opposite end of said balloon from said central opening, and cooperative engagement means between said opposite end of said hub member and said cap member, forming a hub assembly of said cap member removably interlocked to said hub member with said opposite end of said balloon engaged therebetween;

(d) a through passageway communicating from the outside of said hub, through said hub to the interior of said balloon; and

(e) valve means operatively seated in said through passageway to seal the interior of said balloon.

4,693,697

PUSH-PULL TOY

Robert J. Pagano, Mineola, N.Y., assignor to Wonderline, Inc., Bossier City, La.

Filed Dec. 4, 1985, Ser. No. 804,416
Int. Cl.[4] A63H *5/00, 11/10*
U.S. Cl. 446—272 **14 Claims**

1. A push or pull toy comprising:

a body portion formed in the shape of an animal body and defining an internal concave surface and a transparent window overlying said internal concave surface to form a chamber;

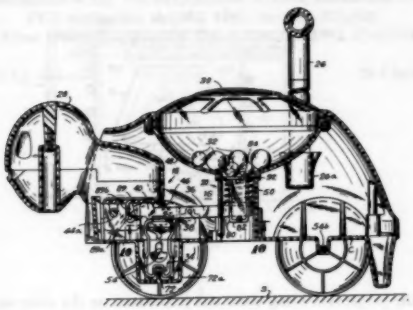
a plurality of objects freely contained within said internal chamber;

a head portion pivotally supported by said body portion;

support and transport means, including a plurality of wheels,

for supporting said body portion and enabling transport thereof over a supporting surface in response to an applied force;

dual ancillary movement means having a first branch coupled to said head portion and adapted to effect nodding movement of a first character of said head portion and a second branch adapted to effect a second ancillary movement of a popping action imparted to said objects in a



sparadic projection of two or more objects simultaneously against said transparent window;

collecting means defined in said internal concave surface causing said objects to accummulate near said second ancillary movement means;

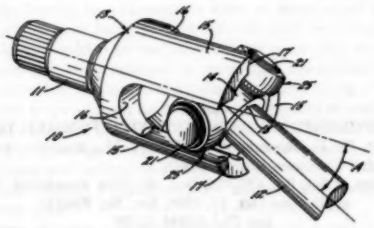
said ancillary means effecting both of said ancillary movements in response to actuation by said support and transport means.

4,693,698

COMPOSITE ROLLER FOR THE TRIPOD OF A FREE-PLUNGING CONSTANT VELOCITY UNIVERSAL JOINT

Dean A. Olson, II, Rockford, Ill., assignor to Rockford Acromatic Products Co., Rockford, Ill.

Filed Nov. 16, 1981, Ser. No. 321,450
Int. Cl.[4] F16D *3/20*
U.S. Cl. 464—111 **3 Claims**



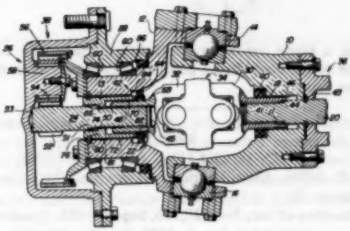
1. A free-plunging constant velocity universal joint of the tripod type for connecting a first rotatable shaft to a second rotatable shaft which is inclined at a joint angle relative to said first shaft, said joint comprising a housing member rotatable with one of said shafts and having three angularly spaced branches separated by angularly spaced slots, the sides of said branches defining tracks, a tripod rotatable with the other of said shafts, said tripod having three angularly spaced trunnions which project radially into said slots, rollers on said trunnions and each having arcuate inner and outer bearing surfaces, each of said rollers being of single-piece construction and being made of steel, needles located between each trunnion and the inner bearing surface of the associated roller and supporting the roller for rotation and for back and forth sliding on the trunnion, the outer bearing surfaces of said rollers being disposed in rolling engagement with said tracks, said universal joint being characterized in that the hardness of the outer bearing surface of each roller is less than the hardness of the inner bearing surface of such roller and is less than the hardness of said tracks.

4,693,699

SEAL ASSEMBLY FOR ROTARY AND RECIPROCATING MOTION

Stanley M. Gregerson, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Sep. 24, 1985, Ser. No. 779,554
Int. Cl.[4] F16D *3/84*; B60K *17/30*
U.S. Cl. 464—133 **8 Claims**



8. In the combination of a housing for a planetary assembly having a shaft opening, a drive shaft extending into said opening for axial and rotary movement relative to the housing and having an axial passage open to the interior of the housing, and a driven shaft in the housing extending into the axial passage of the first shaft and splined to the first shaft for rotation therewith and axial sliding movement relative thereto, a sealing arrangement between the first shaft and the housing comprising:

a sleeve positioned over said shafts and between said drive shaft and housing, said sleeve being splined to one of said shafts for rotation with said shafts and axial movement relative to said drive shaft;

means for preventing axial movement of the sleeve relative to the housing;

a first seal positioned between and sealingly engaging said sleeve and housing; and

a second seal positioned between and sealingly engaging said sleeve and drive shaft.

4,693,700

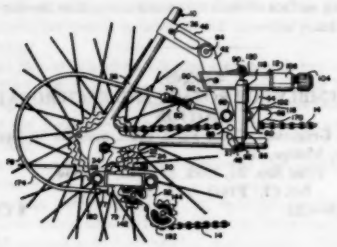
DERAILLEUR SHIFTER

Gilmore H. Chappell, 6147 Christian St., Philadelphia, Pa. 19143

Continuation-in-part of Ser. No. 707,960, Mar. 4, 1985, Pat. No. 4,599,079. This application Jul. 8, 1986, Ser. No. 883,147
Int. Cl.[4] F16H *9/24*
U.S. Cl. 474—80 **16 Claims**

1. In an improved automatic shifter for a derailleur attached to a frame of a bicycle having a large drive gear, an endless drive chain, a rear axile and a cluster of driven gears of the type having a pivot arm means secured to the frame in spaced relation from the derailleur, a shifter arm means pivotally secured to the pivot arm means to move relative to the frame, a biasing means interconnected between the pivot arm means and the shifter arm means to continuously urge the shifter means pivotally about the pivot arm means, a stabilizing means interconnected between the pivot arm means and the shifter arm means to retard the bias of the biasing means, and a cable means interconnecting a portion of the shifter arm means and the derailleur to move the derailleur to index the chain across the cluster of driven gears in response to pivotal movement of

the shifter arm means, the improvement comprising a chain slider attached to the shifter arm means, the chain slider com-



prising a blade having a contacting surface, the contacting surface of the blade being continuously biased against the said endless drive chain.

4,693,701

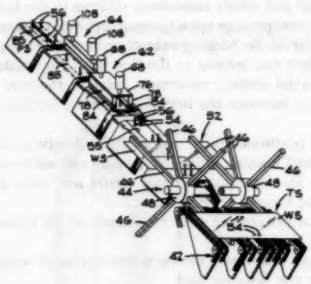
TWIN WICKETING BAG MACHINE

René F. deBin, Aalst, Belgium, assignor to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 528,926, Sep. 2, 1983, abandoned. This application Jan. 6, 1986, Ser. No. 816,692

Int. Cl.[4] B31B *23/14;* B21B *1/98*

U.S. Cl. 493—204 **14 Claims**



1. In a bag making apparatus of the type for processing an elongated strip of thermoplastic web material being operative to divide the web into segments of equal dimension and provide each segment with at least two apertures located adjacent to and on either side of in the longitudinal median of each segment, the segments on being produced are transferred to a stacking device provided with stacking posts on which successive segments are stacked on posts projecting through the apertures,

the improvement in said apparatus comprising means operative while a stack of segments is retained on said stacking device for producing lines of perforation dividing each segment to define two bags.

4,693,702

ROTOR HAVING FRANGIBLE PROJECTIONS THEREON

David M. Carson, Newtown, and Oakley L. Weyant, Jr., Southbury, both of Conn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

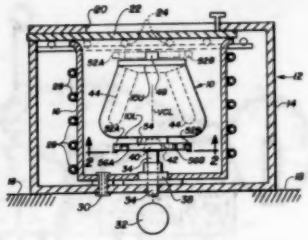
Filed Aug. 4, 1986, Ser. No. 892,262

Int. Cl.[4] B04B *7/02, 15/02, 9/10*

U.S. Cl. 494—61 **20 Claims**

1. A centrifuge rotor for use in a centrifuge instrument of the type having an enclosable and evacuable chamber with a drive member adapted to connect the rotor to a source of motive energy projecting into the chamber, the rotor having a predetermined weight associated therewith,

the rotor having at least a first projection connected thereto through a frangible connecting region, the frangible connecting region being configured so as to fracture and thereby separate the projection from the rotor when the rotor is driven to a predetermined rotational speed,



the projection being sized and positioned on the rotor so as to exhibit an unbalance of less than the multiplication product of 0.5 gram-inches for each pound of rotor weight so that the projection may separate from the rotor without unbalancing the same to an extent sufficient to cause the rotor to leave the drive member,

the projection upon separation from the rotor forming a projectile having an energy content sufficient to puncture the chamber to admit ambient air thereinto thereby to windage limit the rotational speed of the rotor.

4,693,703

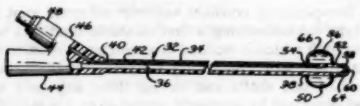
NEPHROSTOMY CATHETER WITH FORMED TIP

Helmut W. G. Rosenberg, McHenry, Ill., assignor to The Kendall Company, Boston, Mass.

Division of Ser. No. 683,056, Dec. 18, 1984, abandoned. This application Oct. 17, 1986, Ser. No. 920,811

Int. Cl.[4] A61M *31/00*

U.S. Cl. 604—49 **2 Claims**



1. A method of performing a nephrostomy procedure, comprising the steps of:

placing a guide wire in a patient's body with a distal end of the guide wire located in the renal calyces;

advancing a catheter over the guide wire until a distal portion of the catheter is located in the renal calyces; and

inflating a balloon of the catheter in the renal calyces.

4,693,704

CERVICAL CANAL CATHETER

Sachio Ogita, 9-19, Amamihigashi-6-chome, Matsubara-shi, Osaka-fu, Japan, assignor to Sumitomo Bakelite Company Limited, Toyko and Sachio Ogita, Osaka, both of, Japan

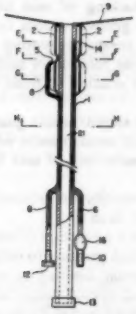
PCT No. PCT/JP83/00340, § 371 Date Jun. 5, 1984, § 102(e) Date Jun. 5, 1984, PCT Pub. No. WO84/01514, PCT Pub. Date Apr. 26, 1984

Continuation of Ser. No. 619,150, Jun. 5, 1984, abandoned. This PCT application Oct. 12, 1983, Ser. No. 824,316

Claims priority, application Japan, Oct. 12, 1982, 57-17759

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—55 16 Claims



1. A cervical canal catheter comprising:

a catheter main tube made of a soft rubber or resin and defining a main cavity therein, said main cavity having an open end at or in contiguity to the tip of said main tube, said tip being essentially perpendicular to a central axis of said main tube;

a balloon assembly, surrounding the outer periphery of the tip, having two expandable lobes of about equal size, a narrow part being present between said two lobes, and being provided around said catheter main tube, said narrow part being adapted for receiving a strangulation ring formed by a ligature, said balloon assembly being of a size and shape adapted for the intimate adhering of said lobes to a cervical canal subjected to plication and narrowing by surgical ligature when said lobes are expanded, thereby fixing said catheter in the cervical canal;

means defining a liquid-medicine injecting hole in the narrow part;

means defining a balloon injection-hole in a part of said catheter main tube surrounded by said balloon assembly for delivering a fluid under pressure into each said lobe to cause said expansion thereof;

a balloon-injection passage for delivering said fluid to said means defining a balloon-injection hole;

a liquid-medicine injecting passage for delivering a liquid medicine to said liquid-medicine injecting hole, an end portion of said liquid medicine injecting passage at said liquid medicine injecting hole extending outside of said balloon assembly;

said balloon injection-passage and said liquid-medicine-injecting passage each having for a majority of the lengths thereof, a side thereof defined by a wall of said catheter main tube, and, at the end of said catheter main tube, branching off from said catheter main tube.

4,693,705

VAGINAL CONTRACEPTIVE SYSTEM

Ilona B. Gero, 300 Park Ave. South, Suite 1410, New York, N.Y. 10010

Continuation of Ser. No. 598,208, Apr. 9, 1984, abandoned. This application Jul. 11, 1986, Ser. No. 884,753

Int. Cl.[4] A61M *31/00*

U.S. Cl. 604—55 6 Claims

1. An intravaginal contraceptive porous sponge adapted for immediate use upon removal from a sealed packet and the sponge containing a minimal spermicidally effective amount of nonylphenoxypoly (ethyleneoxy) ethanol as the spermicide in a bacteria-free aqueous solution, pectin and at least one preservative.

4,693,706

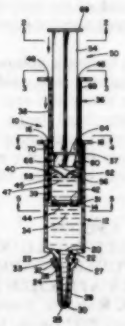
TWO COMPARTMENT MIXING SYRINGE

James F. Ennis, III, Preston, Conn., assignor to Mark L. Anderson, Elmwood, Wis.

Filed Aug. 11, 1986, Ser. No. 895,237

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—87 13 Claims



1. A mixing syringe, comprising:

an inner cylindrical barrel open at one end and closed at its other end and defining an inner compartment therein for containing a quantity of a liquid;

a membrane bonded to the other end of said inner barrel closing the same thereat;

an outer cylindrical barrel open at one end thereof and defining an outer compartment therein for containing a material to be mixed with said liquid, said inner barrel being axially inserted through said one end of said outer barrel in slidable sealing contact therewith;

an elongated plunger axially movable in said inner barrel and having a head force fitted in sliding, frictional, sealing contact with said inner barrel for exerting pressure on said liquid when said plunger is advanced axially to rupture said membrane, so that said liquid enters said outer compartment and mixes with said material therein;

an open tip at the other end of said outer barrel for discharging said mixture of said liquid and said material from said outer compartment, when said plunger and said inner barrel are advanced axially in said outer barrel;

said inner cylindrical barrel having a stop means intermediate the ends thereof for preventing said elongated plunger from moving axially therefrom when subjected to an inadvertently applied force; and

said inner barrel having means extending from said stop means to said open end of said inner barrel for venting air therethrough when said elongated plunger is axially moved from said open end to said stop means.

4,693,707

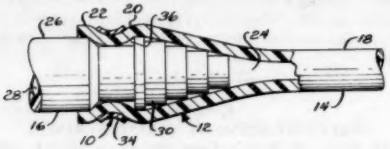
TAMPER DISCOURAGING DEVICE

John F. Dye, Elgin, Ill., assignor to The Kendall Company, Boston, Mass.

Continuation of Ser. No. 630,175, Jul. 12, 1984, abandoned. This application Mar. 4, 1986, Ser. No. 836,262

Int. Cl.[4] A61M *27/00*

U.S. Cl. 604—111 **4 Claims**



1. A tamper discouraging device in a liquid drainage system, comprising:

an elastic catheter having an elongated shaft, a connector adjacent a proximal end of the catheter, and a drainage lumen extending through a major portion of the shaft and the connector;

a hollow drainage tube having a hollow adapter at an upstream end of the drainage tube, said adapter being received in the catheter connector; and

a circumferential endless band being heat shrunk only against the catheter over said connector and adapter, said band being spaced from the adapter and an outer end of the connector, said band being free of adhesive.

4,693,708

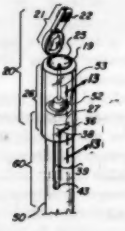
COMBINATION NEEDLE SHIELD/NEEDLE GUARD DEVICE FOR A HYPODERMIC SYRINGE WITH A PERMANENTLY ATTACHED NEEDLE

Alan A. Wanderer, 1075 E. Radcliffe, Englewood, Colo. 80110, and William E. Sagstetter, 2217 Grove, Denver, Colo. 80210

Filed Oct. 16, 1986, Ser. No. 919,373

Int. Cl.[4] A61M *5/32*

U.S. Cl. 604—198 **9 Claims**



1. A combination needle shield/needle guard device which is positively locked onto a hypodermic syringe with a permanently attached needle;

said hypodermic syringe comprised of a syringe barrel with needle hub which is an integral part of front end of said syringe barrel;

said hypodermic needle permanently attached to said needle hub on front end of said syringe barrel;

said hypodermic syringe comprised of said syringe barrel with piston, said piston sliding inside said syringe barrel, providing means to force liquid medicament inside said syringe barrel through opening of said needle;

said needle shield/needle guard device comprising a hollow cylindrical housing which is sealed at its proximal end on weakend annular zone with an integral pull-off tab, said cylindrical housing with an internal protrusion located on distal inner wall of said cylindrical housing;

means for positive locking of said needle shield/needle guard device onto groove system on front end of said syringe barrel, said means preventing forward, backward and counterclockwise rotation of said needle shield/needle guard device in relation to front end of said syringe barrel;

means for said needle shield/needle guard device as needle shield to enclose said sterile needle which is permanently attached to said needle hub of said hypodermic syringe barrel;

means for aperture formation on proximal end of said needle shield/needle guard device;

means to prevent direct retraction of said cylindrical housing from extended lock position to retracted lock position;

means for said cylindrical housing of needle shield/needle guard device as said needle guard which can retract in relation to said syringe barrel, such that said cylindrical housing with said aperture can be moved from said extended lock position to said retracted lock position, uncovering said needle with said cylindrical housing;

means for said cylindrical housing of needle shield/needle guard device as said needle guard which can extend in relation to said syringe barrel, such that said cylindrical housing can be moved from said retracted lock position to said extended lock position, re-covering said needle with said cylindrical housing from behind the needle point of said needle;

means for said cylindrical housing as said needle guard to retract and extend ad-finitum in relation to said syringe barrel;

means for visibility of volumetric calibrations on said syringe barrel when said cylindrical housing has moved intos aid retracted lock position on said syringe barrel.

4,693,709

SYRINGE

Robert D. George, Lake St. Louis, and Robert D. Banning, St. Peters, both of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

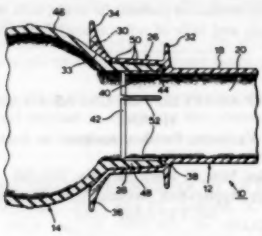
Filed Apr. 8, 1985, Ser. No. 720,825

Int. Cl.[4] A61M *1/00*

U.S. Cl. 604—212 **12 Claims**

1. An irrigation syringe barrel device comprising an integral single piece barrel including a cylindrical portion having a cylindrical bore open at the proximal end thereof and capable of receiving a sryinge plunger rod having a piston thereon slidable longitudinally in sealing engagement with the walls of said bore for generating fluid pressure in said bore, an integral syringe tip at the distal end of said cylindrical portion in fluid communicaion with said bore, integral axially extending collar means at the proximal end of said cylindrical portion, and a radially inwardly extending integral wall portion integrally connecting the distal end of said collar means with said cylindrical portion at a point distally of the proximal end of said cylindrical portion and with the radially inner surface of said collar means in radial spaced relation with the radially outer surface of said cylindrical portion, said inner surface of said

collar means and said outer surface of said cylindrical portion defining an axially extending substantially annular groove open at the proximal end thereof, said groove being capable of



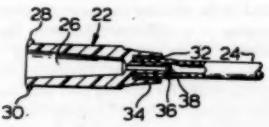
receiving a cylindrical end portion of an elastomeric syringe bulb in tight fitting engagement with said inner surface of said collar means and said outer surface of said cylindrical portion.

4,693,710

TUBE AND FITTING ASSEMBLY AND METHOD OF MAKING SAME

George W. McCool, St. Joseph, Mo., assignor to Sherwood Medical Company, St. Louis, Mo.

Filed Mar. 13, 1985, Ser. No. 711,547
Int. Cl.[4] A61M *5/20*
U.S. Cl. 604—283 **12 Claims**



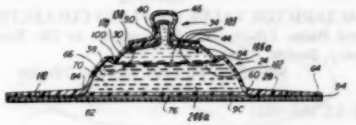
1. A medical tube and fitting assembly comprising a molded single-piece thermoplastic fitting including a luer connector having a luer tapered bore for connection with a luer tapered connector of another member, an axially extending pin adjacent one end of said fitting having a bore connected with said luer tapered bore and of smaller diameter than that of said luer tapered bore, a collar surrounding said pin and being open at the distal end thereof, said luer connector, said collar and said pin all being of the same thermoplastic material and integrally and jointlessly connected together, a plastic tube having one end portion disposed in said collar and surrounding said pin in tight, frictional engagement therewith and extending distally beyond the distal end of the said collar, said collar being heat and pressure shaped by spin forming into surrounding, tight, frictional engagement with the radially outer surface of said tube end portion with said tube end portion clamped between the radially inner surface of said collar and the radially outer surface of said pin to fixedly connect said collar, pin and tube together to form a fluid-tight mechanical connection between said fitting and said tube, said mechanical connection being established solely by said collar, pin and tube during said spin forming, the outer wall of said collar tapering distally inwardly and being of substantially minimum outer diameter at the distal end thereof.

4,693,711

LONG-LIFE BIOMEDICAL TRANSCUTANEOUS DRUG APPLICATION DEVICE AND METHOD OF TRANSCUTANEOUS APPLICATION OF DRUGS

Roger E. Bremer, 5 Horizon Rd., Fort Lee, N.J. 07024; Charles Anthony, Jr., 53 Hickory Pl., Livingston, N.J. 07039, and Raymond M. Chappel, 21 Florie Farm Rd., Mendham, N.J. 07945

Division of Ser. No. 333,287, Dec. 22, 1981, Pat. No. 4,526,176. This application Apr. 19, 1985, Ser. No. 725,227
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—306 **5 Claims**



1. Method of transcutaneously applying substances, such as drugs, to a body surface of a person, comprising

providing a biomedical transcutaneous application device, said transcutaneous application device comprising

a generally cup-shaped housing (**24**) of a flexible material, including a vaulted, downwardly open dish or cup-like structure forming a dome-shaped roof;

a microporous membrane sealed to and extending across the housing at a base thereof, and closing off the downwardly open housing for defining a chamber (**66**) within the housing;

a peelable, releasable, fluid-impervious protective cover film (**90**) overlying said membrane;

a liquid-compatible, pressure-sensitive adhesive means (**94**) securing said releasable cover film (**90**) to said base (**56**) of the housing, said protective film being selectively removable to expose said membrane and permit attachment of said device to a body surface;

means (**101, 102**) for subdividing said chamber into a first chamber portion (**166, 166*a***), and a second chamber portion (**266, 266*a***);

a ring-like transformation zone (**100**) circumscribing said housing at a height intermediate upper and lower limits thereof, said transformation zone extending in a plane generally parallel to said fluid-permeable membrane (**76**) and forming a mechanical discontinuity of the wall of said housing, said vaulted roof of said housing being displaceable downwardly in response to pressure applied thereto to deform said housing at said transformation zone and providing for snap-over or toggle action upon application of pressure to a top portion of the dome-shaped housing, resulting in deformation of the housing;

said subdividing means (**101, 102**) being of frangible material subject to rupture upon deformation and displacement of a wall of the housing;

at least a first body-affecting substance located in one of said chamber portions; and

a second body affecting substance, differing from said first substance located in the other chamber portion,

said substances being separated from each other during storage within said chamber portion but mixing and penetrating through the microporous membrane (**76**) to affect the skin of the user for transcutaneous application of at least one of said substances thereto,

said method comprising the steps of

stripping the peelable, releasable, fluid-impervious protective cover film from said microporous membrane;

applying the base of said housing to the body surface of a subject;

firmly pressing the housing into positive contact with the body surface of the subject and securing said membrane in contact with the body surface; and

applying pressure to a top portion of the dome-shaped housing and deforming the walls of said housing to physically transform the shape of the housing to assume a different profile with a resulting change of configuration, said pressure applying and deforming step including

rupturing or breaking the separating means to permit mixing of the substances in said chamber portions, and apply pressure on said mixed substances to provide for penetration thereof through the microporous membrane (76) and establish transcutaneous application of said substance to the body surface of the subject.

4,693,712

BACTERICIDE VALVE ON FLUID COLLECTION BAG

David Bates, Libertyville, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Nov. 14, 1985, Ser. No. 798,209
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—323 **8 Claims**

1. A liquid collection system for collecting and discharging fluids from a patient, comprising:

a collection bag having a chamber for collection of liquid;

a tubular section in fluid communication with a lower portion of said chamber;

a valve assembly means having a valve seat and valve assembly on said tubular section having a means for opening and closing off any flow of liquid around a bactericide element in said valve means and said valve seat upstream of said bacteriacide element, downstream from said collection bag, said valve assembly also including a piston slidably disposed in a housing, said piston having a cage for enclosing said bactericide element in which fluid, when released from said collection bag, washes over said bactericide element when said valve means is opened, and stops the wash over of said bactericide element when said valve means is closed, whereby retrograde contamination to said system is minimized.

4,693,713

ABSORBENTS FOR BLOOD AND SEROUS BODY FLUIDS

Miroslav Chmelir, Grönkesdyk 36, 4150 Krefeld; Kurt Dahmen, von-Velsen.str.6, Möchengladbach; Georg Hoffman, Westwall 165, 4150 Krefeld, and Georg Werner, Dresdner Str.7, 4154 Tönisvorst 1, all of Fed. Rep. of Germany

PCT No. PCT/DE82/00146, § 371 Date Mar. 10, 1983, § 102(e) Date Mar. 10, 1983, PCT Pub. No. WO83/00289, PCT Pub. Date Feb. 3, 1983
Continuation of Ser. No. 485,128, Jun. 15, 1983, abandoned.
This PCT application Jul. 10, 1982, Ser. No. 928,573
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1981, 3128100
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—368 **19 Claims**

1. An absorbent for blood or other serous body fluids comprising a physical mixture of components A and B wherein:

component A is at least one compound selected from the group consisting of water-swellable and water-insoluble synthetic and natural polymers and copolymers; and

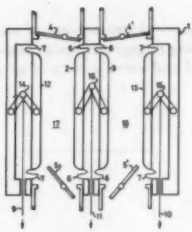
component B is at least one compound not harmful to health which is water soluble and present in the form of a pourable powder at ambient temperature selected from the group consisting of thiourea, methyl urea, ethyl urea, acrylamide, methacrylamide, monosaccharides, oligosaccharides, inorganic acids, monocarboxylic acid, polycarboxylic acid, amides of carboxylic acids, salts of monocarboxylic acids and salts of polycarboxylic acids.

4,693,714

DOUBLE PUMP ADAPTED FOR USE AS AN ARTIFICIAL HEART

Stig Lundbäck, Vaxholm, Sweden, assignor to Astra-Tech Aktiebolag, Stockholm, Sweden

Filed Mar. 8, 1985, Ser. No. 709,555
Claims priority, application Sweden, Mar. 30, 1984, 8401779
Int. Cl.[4] A61F *2/22*
U.S. Cl. 623—3 **6 Claims**



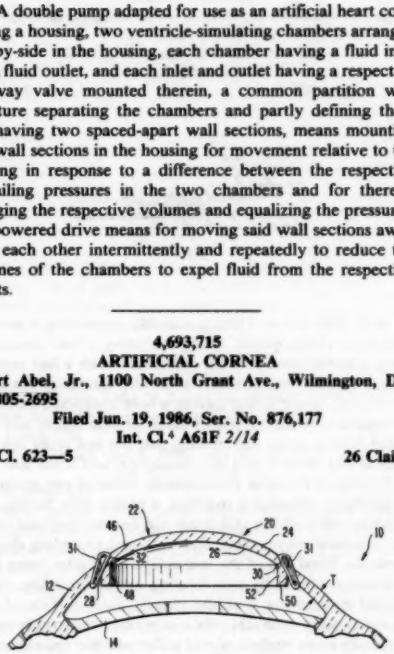
1. A double pump adapted for use as an artificial heart comprising a housing, two ventricle-simulating chambers arranged side-by-side in the housing, each chamber having a fluid inlet and a fluid outlet, and each inlet and outlet having a respective one-way valve mounted therein, a common partition wall structure separating the chambers and partly defining them and having two spaced-apart wall sections, means mounting said wall sections in the housing for movement relative to the housing in response to a difference between the respective prevailing pressures in the two chambers and for thereby changing the respective volumes and equalizing the pressures, and powered drive means for moving said wall sections away from each other intermittently and repeatedly to reduce the volumes of the chambers to expel fluid from the respective outlets.

4,693,715

ARTIFICIAL CORNEA

Robert Abel, Jr., 1100 North Grant Ave., Wilmington, Del. 19805-2695

Filed Jun. 19, 1986, Ser. No. 876,177
Int. Cl.[4] A61F *2/14*
U.S. Cl. 623—5 **26 Claims**



1. A corneal implant adapted to be received in a substantially circular corneal aperture and sutured thereto, the cornea having a thickness T, comprising:

a substantially circular main body portion having anterior and posterior surfaces,

said main body portion having a radially outwardly facing, substantially cylindrical peripheral surface with a height H greater than T and adapted to engage the edge forming the corneal aperture, said peripheral surface having a diameter substantially equal to the diameter of said anterior surface; and

means, on said main body portion, for receiving sutures therethrough to couple said main body portion to the cornea,

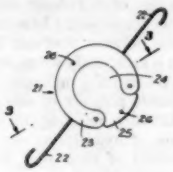
said peripheral surface extending posterior of said cornea when said implant is sutured to the cornea.

4,693,716

MULTIPARTITE INTRAOCULAR LENS

Richard J. Mackool, 31-27 41st St., Astoria, N.Y. 11103

Filed Aug. 21, 1984, Ser. No. 643,030
Int. Cl.[4] A61F *1/16, 3/13*
U.S. Cl. 623—6 **11 Claims**



1. An intraocular lens implant, comprising:

(a) a lens body centered on a lens axis and extending along a plane normal to said lens axis, said lens body including a plurality of separate sections each of which has at least one dimension as considered along said plane which is a fraction of the diameter of said lens body to permit initial separate introduction of the respective sections into the eyeball through an incision smaller than that which would be needed for the introduction of the complete lens body, followed by subsequent assembly of said sections within the eyeball into the lens body,

(b) means for holding the assembled lens body in a predetermined position in the eyeball,

(c) one of said sections being a substantially C-shaped peripheral section and another one of said sections is a substantially circular central section at least partially circumferentially surrounded by said peripheral section in the assembled condition of said lens body,

(d) said peripheral and central sections having respective internal and external surfaces which face one another in the assembled condition of said lens body, one of said surfaces being provided with at least one projection and the other of said surfaces having at least one recess which receives said projection in the assembled condition of said lens body to hold said central section in a predetermined position relative to said peripheral section, and

(e) said projection being configured as a substantially circumferentially extending rib, and said recess being configurated as a substantially circumferentially extending groove.

4,693,717

INTRAOCULAR LENS FORMED IN SITU WITHIN THE EYE

Paul E. Michelson, 2280 Calle Tiara, La Jolla, Calif. 92037

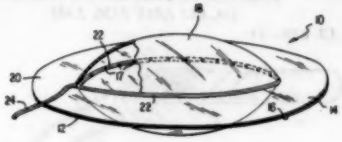
Filed Mar. 12, 1986, Ser. No. 838,692
Int. Cl.[4] A61F *2/16*
U.S. Cl. 623—6 **4 Claims**

1. A method of implanting an intraocular lens within an eye, said method comprising:

providing a collapsible lens mold comprised of two transparent, flexible, film-like sheets which are bonded together to form a sheath which defines a cavity bounded by opposite anterior and posterior portions of the sheath, said portions each being preformed so that the cavity has a predetermined lenticular shape when the cavity is filled with a flowable material, said mold further including a tubule connected to said sheath and communicating with said cavity for providing a conduit for a flowable material to be injected into said cavity;

inserting said mold in a collapsed condition into an eye so that said tubule is accessible to a tool for injecting a flowable material into the cavity of said sheath via said tubule;

providing a lenticular material which has a first state in which the material is flowable and a second state in which



the material is shape retaining and has a desired refractive index, the material changing from the first state to the second state under conditions extant within the eye;

injecting said material, while in the first state, into the cavity of the sheath through the tubule until the cavity is filled, the material assuming the lenticular shape determined by the preformed portions of the sheath; and

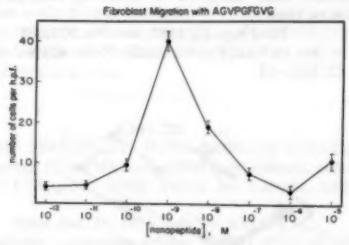
allowing the material to change from the first state to the second state, thereby retaining the lenticular shape determined by the preformed portions of the sheath and forming an optical lens within the sheath having a power determined by said lenticular shape and the refractive index of the material.

4,693,718

STIMULATION OF CHEMOTAXIS BY CHEMOTACTIC PEPTIDES

Dan W. Urry, and Marianna M. Long, both of Birmingham, Ala., assignors to University of Alabama in Birmingham, Birmingham, Ala.

Filed Oct. 31, 1985, Ser. No. 793,225
Int. Cl.[4] A61F *2/02;* A01N *1/02*
U.S. Cl. 623—11 **10 Claims**



1. A prosthetic device wherein a surface of said device has a chemotactic peptide of the formula

$$B^1\text{-X-(AGVPGFGVG)}_n\text{-Y-}B^2$$

wherein

A is a peptide-forming residue of L-alanine:

P is a peptide-forming residue of L-proline;

G is a peptide-forming residue of glycine;

V is a peptide-forming residue of L-valine;

F is a peptide-forming residue of L-phenylalanine;

B^1 is H or a biocompatible N-terminal group;

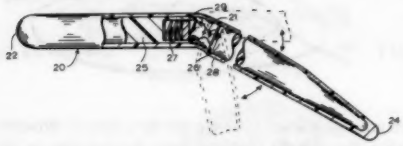
B^2 is OH, OB^3 where B^3 is a non-toxic metal ion, or a biocompatible C-terminal group:
X is GVPGFGVG, VPGFGVG, PGFGVG, GFGVG, FGVG, GVG, VG, G or a covalent bond;
Y is AGVPGFGV, AGVPGFG, AGVPGF, AGVPG, AGVP, AGV, AG, A or a covalent bond; and
n is an interger from 1 to 100; incorporated into said surface.

4,693,719

MECHANICAL PENILE PROSTHESIS

Zenon Z. Franko, Union, N.J., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Feb. 14, 1985, Ser. No. 701,771
Int. Cl.[4] A61F *2/26, 5/00*
U.S. Cl. 623—11 **12 Claims**



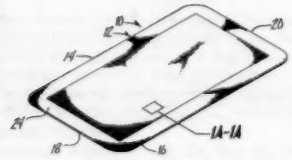
1. A penile erection prosthesis to be fully implanted in a patient having two relatively rigid cylindrically-shaped end segments at least one of the segments having a female end containing a locking mechanism for a flat surfaced connector which joins said segments in two distinct positions, said locking mechanism comprising an axially aligned biasing means located in a receiving means which extends inwardly from a ball socket of said female end, said connector comprising at least one a truncated spherical arm which mates with said ball socket and is secured for rotation within said socket, a first self-locking erect position in which said segments are axially joined and aligned wherein said connected locks into said erect position through the action of the biasing means poressing a flat rider against the flat surface of the spherical arm, and a second unlocked, dependent position in which said segments are joined and non-axially aligned.

4,693,720

DEVICE FOR SURGICALLY REPAIRING SOFT TISSUES AND METHOD FOR MAKING THE SAME

Lorne C. Scharnberg, Des Moines, Iowa, and Deva Devanathan, Warsaw, Ind., assignors to Katecho, Incorporated, Des Moines, Iowa

Filed Sep. 23, 1985, Ser. No. 779,068
Int. Cl.[4] A61F *2/02;* A61B *17/04;* A01N *1/02*
U.S. Cl. 623—11 **2 Claims**



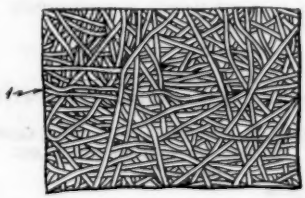
1. A device for use in surgically repairing soft tissues of a living animal, said device comprising:
a flexible planar sheet having a plurality of perimetric edges extending around the perimeter thereof, said sheet being formed by at least first and second groups of strands, each of said groups of strands comprising a plurality of filamentous carbon strands;
each of said strands in said first group of strands extending generally in a first direction, and each of said strands in said second group of strands extending generally in a second direction from said first direction and being formed into an interwoven relationship with said strands of said first group of strands whereby said interwoven first and second groups of said strands combine to form said flexible planar sheet, wherein said first group of strands are interwoven in a regular weave with said second group of strands whereby said strands of said first group pass alternatively over and under adjacent strands of said second group and wherein said strands of said second group pass alternatively over and under adjacent strands of said first group;
a first film of biodegradable polymer coating said first and second groups of strands and holding said first and second groups of strands against relative movement therebetween so as to prevent unraveling of said interwoven relationship of said first and second groups of said strands;
a second film of biodegradable polymer coating said flexible planar sheet adjacent said perimetric edges thereof to form an edging strip extending completely around said perimetric edges of said planar sheet,
said second film comprising a heavier concentration of said biodegradable polymer than said first film whereby said edging strip is sufficiently strong to support sutures when said device is surgically implanted in said animal;
said biodegradable polymer of said first and second films being substantially non-toxic to said living animal and being capable of hydrolyzing and metabolizing over an extended period of time after being surgically placed within said living animal;
said first and second films being the only material coating said flexible planar sheet,
wherein said films are coated according to the method comprising:
applying a first solution to said planar sheet, said first solution comprising said biodegradable polymer dissolved in a solvent;
permitting said solvent of said first solution to evaporate, thereby leaving said first film of said polymer on said planar sheet;
applying a second solution to the perimetric edges of said flexible sheet, said second solution comprising said biodegradable polymer dissolved in a solvent in a greater concentration than the concentration of said polymer in said solvent of said first solution;
permitting said solvent in said second solution to evaporate, thereby leaving said second film of said biodegradable polymer to form an edging strip around said perimetric edges of said planar sheet.

4,693,721

POROUS FLEXIBLE METAL FIBER MATERIAL FOR SURGICAL IMPLANTATION

Paul Ducheyne, 27 Haymarket La., Bryn Mawr, Pa. 19010

Continuation of Ser. No. 661,772, Oct. 17, 1984, abandoned.
This application Apr. 22, 1986, Ser. No. 854,700
Int. Cl.[4] A61F *2/28, 2/02*
U.S. Cl. 623—16 **8 Claims**



7. A biocompatible flexible and permanently deformable porous metallic fiber mesh sheet consisting essentially of a multiplicity of interengaged and intertwined biologically inert

metallic fibers, each of said fibers having a length in the range of about 2 to about 50 millimeters, and a diameter in the range of from about 40 to about 100 micrometers; said fibers being interengaged and intertwined with each other to form a porous mesh having a porosity of from about 80% to about 95%, and a thickness in the range of from about 0.5 to 30 millimeters, said mesh sheet being flexible and permanently deformable without losing its structural integrity and being characterized by an elasticity approximately the same as the elastic properties of trabecular bone, and being further characterized by having an apparent modulus of elasticity in the range of from about 80 to about 100 MPa and by a porosity such that bony tissue can penetrate into the pores of said mesh when said mesh is pressed against the surface of the skeletal structure of a living human or animal.

4,693,722

PROSTHETIC TEMPOROMANIBULAR CONDYLE UTILIZING A PROSTHETIC MENISCUS

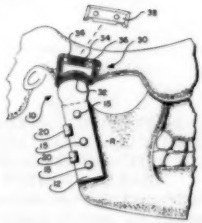
William H. Wall, Suite 201 5139 Jimmy Carter Blvd., Atlanta, Ga. 30093

Continuation-in-part of Ser. No. 524,474, Aug. 19, 1983, Pat. No. 4,502,161, which is a continuation of Ser. No. 303,826, Sep. 21, 1981, abandoned. This application Feb. 7, 1985, Ser. No. 699,138

The portion of the term of this patent subsequent to Mar. 5, 2002, has been disclaimed.

Int. Cl.[4] A61F *2/30*

U.S. Cl. 623—18 **15 Claims**



1. A prosthetic apparatus for the temporomandibular joint, comprising:

a prosthetic condyle comprising first and second plates that are adapted to be mounted to opposite sides of the ramus of the mandible;

a prosthetic meniscus which is adapted to be inserted into the temporomandibular joint capsule between the temporal bone of the patient and the prosthetic condyle, the prosthetic meniscus comprises a resilient insert shaped to be received in the joint capsule positioned adjacent to the glenoid fossa and defining an extension thereof extending outside the joint capsule, reinforcing mesh is embedded within the resilient insert and integrally extends into the extension, and means for fixedly attaching the extending end of the extension to an outer bone surface of the temporal bone outside of the joint capsule, the extension being connected to the insert so as the permit relative movement between the insert and the extension; wherein said first plate of the prosthetic condyle is provided with a convex surface that is located directly adjacent to the prosthetic meniscus.

said second and first plates comprising a flat portion, wherein the flat portion of the first plate is adapted to be mounted to the ramus of the mandible and said first plate also comprises a curved neck portion that extends from the flat portion and on which a convex portion is provided; wherein the flat portion of the first plate further comprises at least one polygonal aperture and, the flat protion of the second plate comprises at least one tang having a polygonal tip that is adapted to mate with with polygonal aperture in the first plate.

4,693,723

SHOULDER PROSTHESIS

Jean-Jacques Gabard, Maule, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Continuation-in-part of Ser. No. 604,936, Apr. 27, 1984, abandoned. This application Mar. 7, 1985, Ser. No. 709,606

Claims priority, application France, May 2, 1983, 83 07251

Int. Cl.[4] A61F *2/40*

U.S. Cl. 623—19 **8 Claims**

1. An implantable shoulder prosthesis for mechanical suspension on a human shoulder blade comprising:

a swivel joint system formed of an articulating sphere attached to one end of a rod and said rod having an opposite end integral with a substantially planar L-shaped blade member and wherein a short leg of said L-shaped member covers an auxiliary edge of said shoulder blade and a longer leg of said L-shaped member covering the natural socket of said shoulder blade; and

a humeral cupula member having an outer and inner substantially spherical surfaces concentric to each other, said surfaces being truncated so as to define an open face terminating in a planar surface close to that of a normal anatomical humeral head; said cupula member being fixed to the humerus by an elongated diaphyseal projection defining a longitudinal axis therethrough and supporting at one end thereof said cupula, whereupon insertion of said projection into a cavity in the humerus said axis passes through a spherical center of said cupula and subtends an angle of approximately 10° with said planar surface such that the articulating sphere is forcefitted directly into the cupula which surrounds over half of the circumference of said sphere.

4,693,724

TOTAL HIP PROSTHESIS WITH PRIMARY FIXATION

Jean L. Rhenter, 57 rue Michelet, 42000 Saint Etienne, and Jean Collomb, L'Olagnier, 26800 Portes les Valence, both of France

Filed Jan. 21, 1986, Ser. No. 820,636

Claims priority, application France, Jan. 31, 1985, 85 01528

Int. Cl.[4] A61F *2/32*

U.S. Cl. 623—23 **6 Claims**

1. An improved total hip prosthesis with primary fixation, comprising:

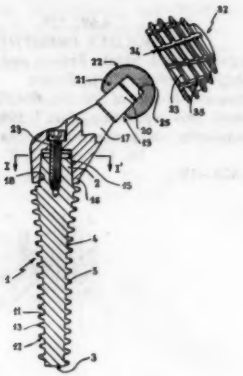
a threaded femoral pin for threadable insertion into a medullary cavity of a femur, said pin having a head at a proximal end and a distal end at an opposite end from said head;

a cotyloidal cupule for engagement with the acetabulum of a threaded hip; and

a prosthetic neck, the neck having a sphere for joining the head of a pin to the cupule;

the threaded femoral pin having a circular cross-section in a plane orthogonal to a sagital plane and along the entire

length of the pin an anatomical profile in a sagital plane defined by a radius of curvature which continuously non-



linearly varies from said distal end of said pin toward said head of said pin.

4,693,725

AQUEOUS LIQUID DYE COMPOSITION CONTAINING BIFUNCTIONAL REACTIVE DYE HAVING BOTH MONOHALOGENOTRIAZINYL AND VINYL SULFONYL FIBER REACTIVE GROUPS

Noriaki Yamauchi; Shinnei Ikeou, both of Hirakata, and Kunihiko Imada, Sakai, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

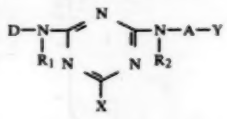
Filed Feb. 20, 1986, Ser. No. 831,300

Claims priority, application Japan, Jul. 17, 1985, 60-157337

Int. Cl.[4] C09B *67/00, 62/00*

U.S. Cl. 8—527 10 Claims

1. An aqueous liquid dye composition, which comprises a bifunctional reactive dye of the following formula,



wherein D is an organic dye residue having at least one sulfonic acid group, R_1 and R_2 are independently a hydrogen atom or an unsubstituted or substituted lower alkyl group, A is an unsubstituted or substituted phenylene or naphthylene group, X is a halogen atom, and Y is $-SO_2CH=CH_2$ or $-SO_2CH_2CH_2Z$, in which Z is a splittable group by an alkali, in an amount of 5 to 50% by weight based on the weight of the liquid dye composition, the liquid dye composition having a pH value of from 3 to 7.

4,693,726

PROCESS FOR DYEING OR PRINTING CELLULOSE FIBERS OR CELLULOSE BLEND FIBERS WITH PYRIDINIUM-TRIAZINE REACTIVE DYE, AXABLE WITHOUT ALKALI

Fritz Meininger, Frankfurt am Main; Peter Mischke, Bad Soden am Taunus; Gerd König, Hofheim am Taunus, and Hartmut Springer, Königstein/Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

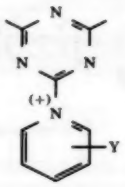
Filed Apr. 3, 1986, Ser. No. 847,722

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1985, 3512630

Int. Cl.[4] D06P *1/38, 3/66;* C09B *62/04*

U.S. Cl. 8—547 18 Claims

1. A process for dyeing cellulose fibers of cellulose blend fibers, which comprises dyeing the fibers mentioned with water-soluble reactive dyes which contain in the dye molecule, as the only fiber-reactive group or groups in the dye molecule, at least once the structural element of the formula



(I)

in which Y denotes a hydroxyl, hydroxymethyl, alkoxy C_1–C_4, aldehyde, carboxamide, monoalkyl C_1–C_4-carboxamide, dialkyl C_1–C_4-carboxamide, monophenyl carboxamide, cyano, alkyl C_1–C_4-oxycarbonyl or sulfo group or a halogen atom, in an aqueous medium within the pH range 4–11.

4,693,727

PROCESS FOR DYEING SYNTHETIC POLYAMIDE MATERIALS WITH FIBRE-REACTIVE ANTHRAQUINONE DYES

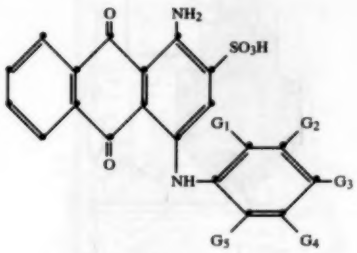
James B. Bowles, Greensboro; Marshall White, Jr., High Point, both of N.C.; Alois Puentener, Rheinfelden, Switzerland; Jean-Marie Adam, Rosenau, France, and Peter Loew, Muenchenstein, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 669,548, Nov. 8, 1984, abandoned. This application Mar. 18, 1986, Ser. No. 841,064

Int. Cl.[4] D06P *1/38, 3/24;* C09B *67/26*

U.S. Cl. 8—549 20 Claims

1. A continuous process for preparing ozone-fast dyeings on synthetic polyamide fiber material from aqueous liquor with anthraquinone dyes which comprises applying to said fiber material from said liquor at least one anthraquinone dye of the formula



in which G_1, G_2, G_4 and G_5 are each hydrogen and G_3 is a α,β-dibromopropionylamino, or in which G_1, G_3, G_4 and G_5 are each hydrogen and G_2 is vinylsulfonyl, chloroacetylamino, 2-methoxy-4-fluoro-s-triazinylamino or 2-ethylamino-4-fluoro-s-triazinylamino, or in which G_1 is methyl, G_2 is 2,6-difluoro-5-chloropyrimidinylamino, G_3 and G_5 are both hydrogen and G_4 is sulfo, or in which G_1 is methoxy, G_2, G_3 and G_5 are each hydrogen and G_4 is β-sulfatoethylsulfonyl, or in which G_1, G_3 and G_5 are each methyl, G_2 is hydrogen or —CH(COOH)—NH—CO—CHBr—CH_2Br and G_4 is α,β-dibromopropionylaminomethyl or —CH(COOH)—NH—CO—CHBr—CH_2Br, or in which G_1, G_3 and G_5 are each methyl, G_2 is α,β-dibromopropionylamino and G_4 is sulfo, or in which G_1 is sulfo, G_2, G_4 and G_5 are each hydrogen and G_3 is α-dibromoacryloylamino.

4,693,728

HYDROCOLLOID BLEND FOR CONTROLLED RELEASE OF CALCIUM IONS

Kenneth Clare, San Diego, Calif., and William Gibson, Horsham, England, assignors to Kelco International Limited, London, England

Filed Aug. 27, 1985, Ser. No. 770,114

Claims priority, application United Kingdom, Aug. 30, 1984, 8421957

Int. Cl.[4] A23L *1/04;* C08L *29/04;* D06P *1/48;* C09D *11/14*

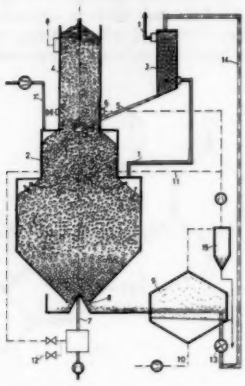
U.S. Cl. 8—561 4 Claims

1. Blend of (2) a hydrocolloid selected from the group consisting of guar, oxidized guar, carboxymethyl guar, hydroxyalkyl guar, polyvinyl alcohol, carboxymethyl cellulose, xanthan gum, cold water soluble locust bean gum, cold water soluble starch, hydroxyethylated starch, and hydroxypropylated starch and (2) a calcium, barium, or strontium salt wherein the ratio by weight of salt to hydrocolloid ranges from 10:1 to 1:20.

4,693,729
METHOD FOR GASIFYING SOLID FUELS

Georg Beckmann, Vienna; Bruno Hillinger, Hinterbrühl, both of Austria, and Bodo Wolf, Freital, German Democratic Rep., assignors to Waagner-Biro Aktiengesellschaft, Austria

Filed Feb. 3, 1986, Ser. No. 825,628
Claims priority, application Austria, Feb. 7, 1985, 348/85
Int. Cl.[4] C10J 3/12, 3/14, 3/16
U.S. Cl. 48—203 11 Claims



1. A method of generating low-tar generator gas from a solid, bituminous fuel, comprising the the steps of

converting the solid fuel into tar-containing generator gas in two gasification zones arranged one above the other, including

introducing hot ballast bodies into the upper gasification zone so as to preheat the solid fuel therein by contact with said hot ballast bodies which are thus admixed with the solid fuel;

introducing a gasification medium which at least in part contains oxygen and water vapor from above into the upper one of said two gasification zones and from below into the lower one of said two gasification zones, whereby the gasification medium contacts the partially combusts the solid fuel under the formation of separate conflagration fronts in said gasification zones with attendant generation of additional heat that brings the solid fuel to the gasification temperature thereof;

discharging the hot tar-containing generator gas produced in said two gasification zones from a region situated between the two gasification zones;

contacting the ballast bodies in a zone separate from said gasification zones with the hot tar-containing generator gas from said gasification zones to preheat the ballast bodies prior to the mixing of the same with the solid fuel, whereby said ballast bodies capture at least a significant proportion of the tar contained in the generator gas and carries said tar with it into the upper gasification zone;

discharging the ballast bodies together with ash resulting from the gasification process from the lower gasification zone;

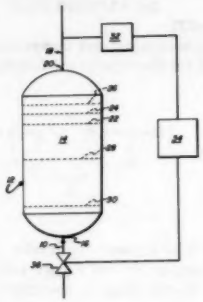
separating the ballast bodies from the ash; and

returning the separated ballast bodies into said zone separate from said gasification zones.

4,693,730
PRESSURE SWING ADSORPTION PRODUCT PURITY CONTROL METHOD AND APPARATUS

Geoffrey Q. Miller, Spring Valley, and Robert L. Gray, Jr., Mahopac, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 24, 1986, Ser. No. 889,795
Int. Cl.[4] B01D 53/04
U.S. Cl. 55—18 20 Claims



1. A process for controlling the level of impurity in a gas product stream from a pressure swing adsorption process including a cocurrent depressurization step, comprising:

sensing a characteristic of the effluent from said cocurrent depressurization step; and

taking a corrective action responsive to the sensed characteristic, said action being effective to vary the impurity concentration in the product gas in the direction necessary to obtain desired product purity.

11. An apparatus for controlling the level of impurity in a gas product stream from a pressure swing adsorption process including a cocurrent depressurization step, comprising:

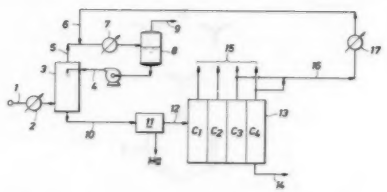
means for sensing a characteristic of the effluent from said cocurrent depressurization step; and

means for taking a corrective action responsive to the sensed characteristic, said action being effective to vary the impurity concentration in the product gas in the direction necessary to obtain desired product purity.

4,693,731
REMOVAL OF MERCURY FROM GASES

Ramanathan R. Tarakad, and Duffer B. Crawford, both of Houston, Tex., assignors to The M. W. Kellogg Company, Houston, Tex.

Filed Oct. 27, 1986, Ser. No. 923,462
Int. Cl.[4] B01D 19/00
U.S. Cl. 55—72 14 Claims



1. A process for removing mercury from a natural gas stream which comprises:

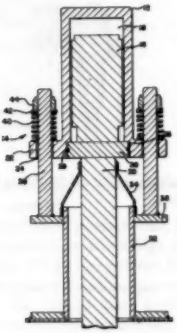
(a) contacting the natural gas stream in a gas/liquid contacting zone with a first mercury-free hydrocarbon liquid having a molecular weight between 20 and 130;

(b) recovering a mercury-enriched hydrocarbon liquid from the gas/liquid contacting zone; and
(c) recovering a mercury-lean methane-rich gas from the gas/liquid contacting zone;
(d) recovering mercury from at least a portion of the mercury enriched hydrocarbon liquid.

4,693,732
PISTON VIBRATOR

William L. Blackford, Peoria, Ill., and Greg Zakharin, Encino, Calif., assignors to Martin Engineering Company, Neponset, Ill.

Filed Feb. 19, 1987, Ser. No. 16,229
Int. Cl.[4] B03C 3/76
U.S. Cl. 55—112 6 Claims

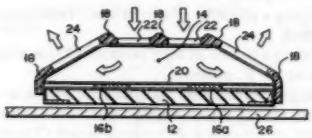


1. A piston vibrator including a housing, a cylinder defined in said housing, a piston slidably disposed in said cylinder, a strike surface associated with said housing and disposed between said piston and a member to be vibrated, means to activate said piston whereby said piston is caused to periodically impact against said strike surface, and selective adjustment means associated with said housing adjustable to selectively vary a pre-load exerted by said housing and strike surface on said member to be vibrated.

4,693,733
AIR CLEANER

Yasuyuki Fuzimura, Zushi, Japan, assignor to Kankyo Company Limited, Japan

Filed Sep. 9, 1986, Ser. No. 905,152
Int. Cl.[4] B03C 3/36
U.S. Cl. 55—129 9 Claims

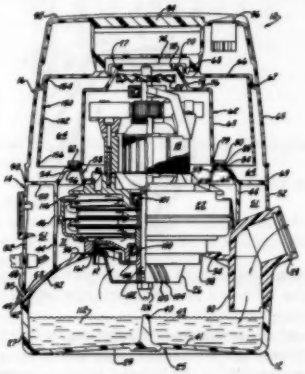


1. An air cleaner comprising:
a substrate;
a pair of anodes mounted on the substrate;
a cathode mounted on the substrate and interposed between the pair of anodes, the cathode being insulated from the pair of anodes; and
a cover mounted on the substrate which covers the pair of anodes and the cathode, the cover having an inlet formed in the region of the cover, which is near from the cathode, and the cover having a pair of outlets formed in the region of the cover, which are near from the pair of anodes, respectively;
the inlet and the pair of outlets being arranged such that when a negative and positive voltage is applied to the cathode and the pair of anodes, respectively, air is inhaled into the cavity defined by the cover and the substrate from the inlet and is vented from the cavity through the pair of outlets.

4,693,734
VACUUM CLEANER CONSTRUCTION

Roy O. Erickson, Jr., Cadillac, Mich., assignor to Rexair, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 782,509, Oct. 1, 1985, Pat. No. 4,640,697. This application May 19, 1986, Ser. No. 864,820
Int. Cl.[4] B01D 47/02
U.S. Cl. 55—248 8 Claims



1. A liquid bath vacuum cleaner comprising a pan assembly adapted to contain a liquid bath including inlet means for enabling ingress of cleaning air into said vacuum cleaner and having an outer wall and a wall extending radially inwardly from said outer wall forming an opening at the top of the pan assembly, a baffle means operably associated with said outer wall and said radial wall of said pan assembly for reducing vacuum noise, a main housing operably associated with said baffle means, said baffle means operably positioned between said pan assembly and said main housing, said main housing including a main housing cavity including outlet means for enabling egress of cleaning air from said main housing cavity and said vacuum cleaner, a cap assembly operable associated with said main housing, said cap assembly including a cap assembly cavity, an inner canister positioned within said cap assembly including a motor, a motor assembly mounted within said inner canister, means for drawing cooling air into said cap assembly associated with said motor, means for enabling cooling air to egress from said inner canister into said cap assembly cavity, means for enabling cooling air to egress from said cap assembly cavity and said vacuum cleaner, means operably associated with said main housing assembly for dividing said main housing assembly from said cap assembly, said dividing means including an opening, means operably associated with said dividing means for separating said main housing cavity from said cap assembly cavity, said separating means including a support ring having an opening associated with and secured to said dividing means at said dividing means opening, and a fan housing assembly, including a fan, positioned within said main housing cavity and associated with and secured to said support ring at said support ring opening, means for establishing a seal between said fan housing assembly and said radially inwardly extending wall and a separator for drawing cleaning

air into said pan assembly and for separating said cleaning air from liquid droplets.

4,693,735

MOTOR-DRIVEN TOOL HAVING AN AIR FILTER

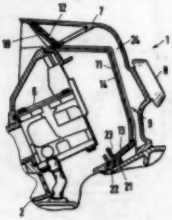
Anton Wehle, Fellbach, Fed. Rep. of Germany, assignor to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Dec. 19, 1986, Ser. No. 943,793

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1985, 3546028

Int. Cl.[4] B01D *46/10*

U.S. Cl. 55—385 R 13 Claims



1. A motor-driven tool equipped with an internal combustion engine such as a portable chain saw or the like, the tool comprising:

a housing for accommodating the engine therein;

a carburetor into which air is aspirated;

a cover mounted on the housing so as to conjointly define a path therewith for the aspirated air and a chamber through which the air passes before it enters the carburetor; and,

a single-piece double-filter unit having a prefilter section and a main filter section, said double-filter unit being mounted in said chamber to place said main filter section ahead of said carburetor in such a manner to cause said main filter section and said cover to conjointly define a compartment within said chamber and to place said prefilter section in the path of the aspirated air so as to cause the aspirated air to first pass through said prefilter section into said compartment and then through said main filter section whereupon the aspirated air passes into the carburetor.

4,693,736

OIL COOLED HERMETIC COMPRESSOR USED FOR HELIUM SERVICE

Lawrence A. Klusmier, Chelmsford, Mass., assignor to Helix Technology Corporation, Waltham, Mass.

Filed Sep. 12, 1986, Ser. No. 906,797

Int. Cl.[4] F25B *9/00*

U.S. Cl. 62—6 20 Claims

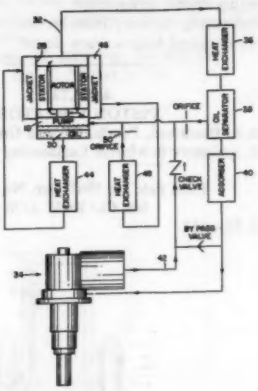
1. A cryogenic refrigeration system having an oil cooled compressor for compressing helium gas comprising:

(a) an oil sump located within the compressor;

(b) a heat exchanger for cooling oil in the sump;

(c) a heat exchange jacket surrounding the compressor for receiving oil cooled by the heat exchanger to cool the compressor;

(d) means for pumping the oil through the heat exchanger and the heat exchange jacket; and



(e) means for recycling the oil from the heat exchange jacket to the oil sump.

4,693,737

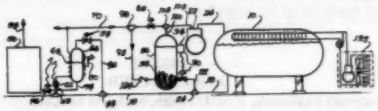
REMOTE COOLING CO_2 APPLICATIONS

Lewis Tyree, Jr., Oak Brook, Ill., assignor to Liquid Carbonic Corporation, Chicago, Ill.

Filed Sep. 25, 1986, Ser. No. 912,048

Int. Cl.[4] F25J *1/00*

U.S. Cl. 62—10 14 Claims



1. A method for providing a plurality of spaced-apart enclosures having a temperature of about −50° F. or below, which method comprises

providing a plurality of spaced-apart enclosures to be refrigerated,

providing a source of high pressure CO_2 at a temperature of about 10° F. or lower,

flowing CO_2 from said high pressure source to a plurality of tanks one of which is associated with each of said enclosures to provide high pressure liquid CO_2 therein,

creating a separate reservoir of CO_2 slush at the triple point thereof,

providing cold CO_2 vapor for absorbing heat from each of said tanks to subcool high pressure CO_2 therein and warm said vapor,

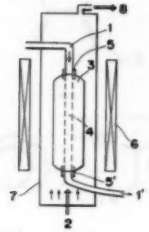
causing said warmed CO_2 vapor to flow into said CO_2 slush reservoir and condense to liquid by melting a solid portion of said slush, and

supplying subcooled liquid CO_2 to each of said enclosures from said associated tank to maintain a desired temperature within said enclosure.

4,693,738
METHOD FOR PRODUCING GLASS PREFORM FOR OPTICAL FIBER

Masao Hoshikawa; Michihisa Kyoto; Koji Yano, and Gotaro Tanaka, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sep. 30, 1985, Ser. No. 781,636
Claims priority, application Japan, Oct. 5, 1984, 59-208032
Int. Cl.[4] C03B *37/014*
U.S. Cl. 65—3.11 6 Claims



1. A method for producing a glass preform for an optical fiber comprising the steps of:

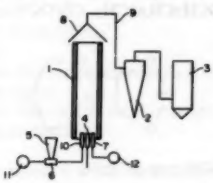
maintaining, for a sufficient contact time, a hollow cylindrical porous glass preform in a first high temperature atmosphere comprising at least one gaseous fluorine-containing compound while jetting a cooling gas through the central hollow part of the porous glass preform to grade an amount of fluorine thereby added in the radial direction of the porous glass preform, said amount of fluorine added to the porous glass preform being added in sufficient quantity and under proper operating conditions to modify the refractive index of said porous glass preform, and said cooling jet being sufficient to provide for the establishment of a gradient of partial pressure of the fluorine-containing compound which increases toward the outer periphery of the porous glass preform, and then

sintering the porous glass preform in a second high temperature atmosphere kept at a temperature higher than the first high temperature atmosphere to make the preform transparent.

4,693,739
METHOD FOR PRODUCING GLASS BUBBLES

Seiichiro Manabe, Itami; Tsutomu Sawano, Nishinomiya, and Takemi Saijo, Yokkaichi, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Jun. 18, 1985, Ser. No. 746,118
Claims priority, application Japan, Jun. 21, 1984, 59-127865
Int. Cl.[4] C03B *19/08, 19/10*
U.S. Cl. 65—21.4 5 Claims

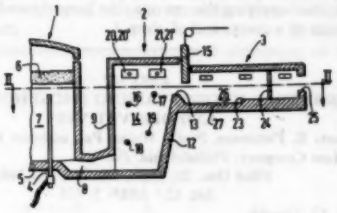


1. A method for producing glass bubbles, which comprises heating a glass powder containing a gas-blowing agent in an atmosphere containing steam having a partial steam pressure of 0.2 to 0.5 atmosphere at a temperature of about 1000° to 1600° C. to expand it.

4,693,740
PROCESS AND DEVICE FOR MELTING, FINING AND HOMOGENIZING GLASS

Robert Noiret, La Ville, and Michel Zortea, Chalon sur Saone, both of France, assignors to Saint-Gobain Vitrage, Courbevoie, France

Continuation of Ser. No. 638,988, Aug. 9, 1984, abandoned. This application Oct. 30, 1985, Ser. No. 792,248
Claims priority, application France, Aug. 9, 1983, 83 13080
Int. Cl.[4] C03B *5/225*
U.S. Cl. 65—135 38 Claims



3. A process for continuously producing fined glass, comprising the steps of:

melting a vitrified charge in a melting chamber to form a molten mass;

delivering said molten mass via a throat from a bottom of said melting chamber to a bottom of a fining chamber in the form of a vertically extending chute;

flowing said molten mass upward in said fining chamber, due to hydrostatic pressure; and

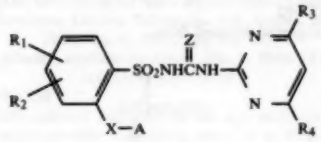
using heating means distributed throughout the length of said chute to homogeneously heat said upwardly flowing molten mass in said fining chamber by at least 100° C. to a fining temperature.

4,693,741
N-PHENYLSULFONYL-N'-PYRIMIDINYLUREAS

Willy Meyer, Riehen, and Werner Föry, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 401,583, Jul. 26, 1982, Pat. No. 4,545,811. This application Jun. 3, 1985, Ser. No. 740,937
Claims priority, application Switzerland, Aug. 6, 1981, 5075/81; Apr. 8, 1982, 2205/82
Int. Cl.[4] C07D *239/69;* A01N *43/54*
U.S. Cl. 71—92 24 Claims

1. A compound of the formula:



wherein

Z is O or S;

X is O, S, SO or SO_2;

A is (i) halogenated alkyl or halogenated alkenyl of up to 6 carbon atoms or (ii) alkyl or alkenyl or up to 6 carbon atoms substituted with an unhalogenated or halogenated alkoxy, alkylthio, alkylsulfinyl or alkylsulfonyl group of up to 4 carbon atoms;

R_1 is hydrogen, halo, alkyl of up to 5 carbon atoms, or R_5—Y— in which Y is O, S, SO or SO_2; and R_5 is an alkyl, alkenyl or alkynyl group of up to 5 carbon atoms;

R_2 is hydrogen, halo, alkyl of up to 5 carbon atoms, haloalkyl of up to 5 carbon atoms, R_5—Y— in which Y and R_5

are as defined above, nitro, R_6OCO— or R_7R_8NCO—, in which R_6 is an alkyl, alkenyl, or alkynyl group of up to 5 carbon atoms; and

each of R_7 and R_8 are hydrogen or an alkyl, alkenyl or alkynyl group of up to 5 carbon atoms;

R_3 is hydrogen, halo, alkyl of up to 4 carbon atoms, alkoxy of up to 4 carbon atoms, alkylthio of up to 4 carbon atoms, haloalkyl of up to 4 carbon atoms, haloalkoxy of up to 4 carbon atoms, or alkoxyalkyl of up to 4 carbon atoms; and

R_4 is halogenated alkoxy or halogenated alkylthio of up to 4 carbon atoms.

15. A method of suppressing plant growth, which method comprises applying thereto or to the locus thereof an effective amount of a compound of claim 1.

4,693,742

HERBICIDAL HYDROXYAMINO PHOSPHONIC ACIDS AND DERIVATIVES

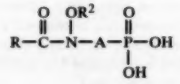
Dennis R. Patterson, North Wales, Pa., assignor to Rohm and Hass Company, Philadelphia, Pa.

Filed Dec. 20, 1983, Ser. No. 563,346

Int. Cl.[4] A01N *57/16*

U.S. Cl. 71—86 **12 Claims**

1. A method of controlling weeds which comprises applying to the surface of the growth medium prior to the emergence of the weeds from the growth medium a compound of the formula:



wherein

R is hydrogen or lower alkyl,

R^2 is hydrogen or lower alkyl, and

A is trimethylene, 1-methylpropenylene, 2-methylpropenylene, 2-ethylpropenylene or hydroxytrimethylene, or an agronomically-acceptable salt or ester thereof, in an amount sufficient to control the growth of the weeds.

4,693,743

HERBICIDAL SULFONAMIDES

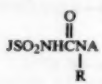
Barry A. Wexler, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Division of Ser. No. 679,145, Dec. 11, 1984, Pat. No. 4,609,397, which is a continuation-in-part of Ser. No. 581,817, Feb. 21, 1984, abandoned. This application May 15, 1986, Ser. No. 863,606

Int. Cl.[4] C07D *239/30, 239/34, 239/47;* **A01N** *43/54*

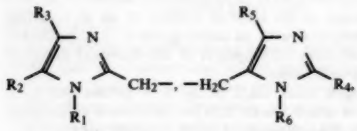
U.S. Cl. 71—92 **9 Claims**

1. A compound selected from:



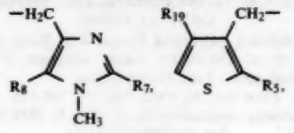
wherein

J is

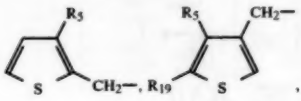


J-1 J-2

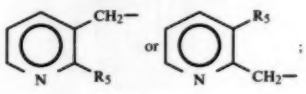
-continued



J-3 J-7



J-8 J-9



J-10 J-11

R is H or CH_3;

R_1 is H, C_1–C_3 alkyl, CO_2R_{15}, $SO_2NR_{16}R_{17}$ or SO_2R_{18};

R_2 is H or CH_3;

R_3 is H or CH_3;

R_4 is H or CH_3;

R_5 is H, CH_3, Cl, Br, CO_2R_{15}, $C(O)NR_{16}R_{17}$, $SO_2NR_{16}R_{17}$, $SO_2N(OCH_3)CH_3$, SO_2R_{18} or NO_2;

R_6 is H, C_1–C_3 alkyl, CO_2R_{15}, $SO_2NR_{16}R_{17}$ or SO_2R_{18};

R_7 is H or CH_3;

R_8 is CO_2R_{15}, $C(O)NR_{16}R_{17}$, $SO_2NR_{16}R_{17}$, $SO_2N(OCH_3)CH_3$, SO_2R_{18} or NO_2;

R_{15} is C_1–C_2 alkyl;

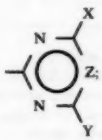
R_{16} is H or C_1–C_2 alkyl;

R_{17} is H or C_1–C_2 alkyl;

R_{18} is C_1–C_2 alkyl;

R_{19} is H, CH_3, Cl, Br, NO_2, C_1–C_2 alkylthio or C_1–C_2 alkylsulfonyl;

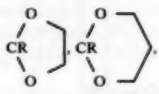
A is



A-1

X is CH_3, OCH_3, Cl, Br, OCH_2CF_3 or $OCHF_2$;;

Y is C_1–C_3 alkyl, CH_2F, cyclopropyl, C≡CH, OCH_3, OC_2H_5, CH_2OCH_3, NH_2, $NHCH_3$, $N(CH_3)_2$, OCH_2CH_2F, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, $OCH_2CH_2OCH_3$, $CR(OCH_3)_2$,



$CR(OCH_2CH_3)_2$ or OCF_2H;

Z is CH;

provided that

(1) when X is Cl or Br, then Y is OCH_3, OC_2H_5, $NHCH_3$, $N(CH_3)_2$ OR OCF_2H;

(2) R_5 and R_6 are not simultaneously H;

(3) when R_6 is other than H or C_1–C_3 alkyl, then R_5 must be H;

(4) R_{12} and R_{13} are not simultaneously H;
(5) when R_{12} is other than H, then R_{13} must be H;
(6) R_5 and R_{19} are not simultaneously H; and
(7) when J is J-8 or J-11 then R_5 is other than H.

2. Compounds of claim 1 where R is H and A is A-1, X is CH_3 or OCH_3 and Y is C_1–C_2 alkyl or C_1–C_2 alkoxy.

3. Compounds of claim 2 wherein J is J-1.

9. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 3.

4,693,744

HERBICIDAL ORTHO-(AZINYL)-BENZENESULFONAMIDES

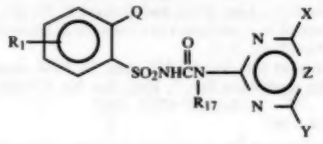
Rafael Shapiro, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 677,600, Dec. 3, 1984, Pat. No. 4,606,754, which is a division of Ser. No. 437,325, Oct. 28, 1982, Pat. No. 4,494,980. This application May 2, 1986, Ser. No. 858,760

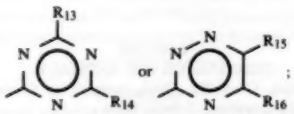
Int. Cl.[4] A01N *47/36*; **C07D** *401/12*

U.S. Cl. 71—93 **10 Claims**

1. A compound of the formula:



wherein
Q is



R_1 is H, F, Cl, CH_3 or OCH_3;
R_{17} is H or CH_3;
R_{13}, R_{14}, R_{15} and R_{16} are independently CH_3 or OCH_3;
X is CH_3, OCH_3 or Cl;
Y is CH_3, C_2H_5, CH_2OCH_3, OCH_3, OC_2H_5, $CH(OCH_3)_2$ NH_2, $NHCH_3$ or $N(CH_3)_2$;
Z is CH
provided that when X is Cl, then Y is OCH_3, OC_2H_5, NC_2, $NHCH_3$ or $N(CH_3)_2$ and when R_1 is CH_3, it is in the 3-, 4- or 5-position of the benzene ring;
and their agriculturally suitable salts.

8. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

4,693,745

CYCLOHEXANEDIONECARBOXYLIC ACID DERIVATIVES WITH HERBICIDAL AND PLANT GROWTH REGULATING PROPERTIES

Hans-Georg Brunner, Lausen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

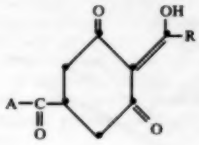
Continuation-in-part of Ser. No. 673,077, Nov. 19, 1984, Pat. No. 4,618,360, which is a continuation-in-part of Ser. No. 610,222, May 14, 1984, Pat. No. 4,584,013. This application Oct. 9, 1985, Ser. No. 785,822

Claims priority, application Switzerland, May 18, 1983, 2693/83; Dec. 19, 1983, 6747/83

Int. Cl.[4] A01N *43/40, 37/00*; **C07D** *265/30, 211/06, 207/00*; **C07C** *121/46, 69/74, 61/08*

U.S. Cl. 71—94 **25 Claims**

1. A cyclohexanedionecarboxylic acid derivative of the formula I



(I)

wherein
A is an $-OR_2$ or $-NR_3R_4$ radical,
R is C_3–C_6cycloalkyl,
R_2, R_3 and R_4 are each independently hydrogen, C_1–C_6alkyl, C_1–C_6haloalkyl, C_1–C_{10}alkoxyalkyl, C_2–C_{10}alkylthioalkyl; C_3–C_6alkenyl which is unsubstituted or substituted by halogen, C_1–C_4alkoxy or C_1–C_4alkylthio; C_3–C_6alkynyl; phenyl or C_1–C_6aralkyl, wherein the phenyl nucleus is unsubstituted or substituted by halogen, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4haloalkyl, nitro or cyano; one of R_3 and R_4 is methoxy; or
R_3 and R_4, together with the nitrogen atom to which they are attached, form a 5- or 6-membered heterocyclic ring system which may contain an additional oxygen or sulfur atom in the ring; and the metal or ammonium salts thereof.

19. A composition, which contains as active ingredient a herbicidal and plant-growth regulating effective amount of a cyclohexanedionecarboxylic acid derivative according to claim 1, together with an inert carrier and/or other inert formulation assistants.

4,693,746

CUBIC BORON NITRIDE SINTERED COMPACT FOR END MILL

Tetsuo Nakai, and Mitsuhiro Goto, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 5, 1987, Ser. No. 567

Claims priority, application Japan, Jan. 6, 1986, 61-858

Int. Cl.[4] C22C *29/04*

U.S. Cl. 75—238 **9 Claims**

1. A cBN sintered compact for an end mill obtained by sintering mixed powder containing about 35 to 50 percent by volume of cubic boron nitride powder smaller than 2 μm in average particle size and a residue of a binder under cBN-stable conditions,
said binder containing about 20 to 30 percent by weight of Al and one or more Ti compounds selected from a group of TiN_z, $Ti(C,N)_z$, TiC_z, $(Ti,M)C_z$, $(Ti,M)(C,N)_z$ and $(Ti,M)N_z$ (where M indicates a transition metal element of the group IVa, Va or VIa of the periodic table excepting Ti and z is within a range of $0.7 \leqq z \leqq 0.85$),
the atomic ratio of the content of Ti in said binder to that of said transition metal element of the group IVa, Va or VIa of the periodic table excepting Ti being about 3/7 to 97/100
further containing tungsten in the form of at least one of said

Ti compound and WC, and the total tungsten concentration in the binder being about 5 to 20 percent by weight.

4,693,747

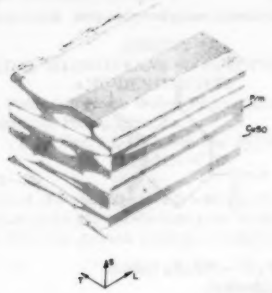
ALLOY HAVING IMPROVED FATIGUE CRACK GROWTH RESISTANCE

Philip E. Bretz, Plum Boro; Jocelyn I. Petit, New Kensington; Ralph R. Sawtell, Squirrel Hill, and Asuri K. Vasudevan, Plum Boro, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 18, 1985, Ser. No. 799,024

Int. Cl.[4] B22F *3/00*

U.S. Cl. 75—249 **43 Claims**



1. A method of increasing the fatigue crack growth resistance of a metal powder product comprising the steps of:

(a) providing a base metal powder alloy;

(b) admixing with said base metal alloy powder a second powder to provide a blend, the second powder capable of providing a grain size in said product greater than that resulting from the base metal powder;

(c) pressing the blend to make a green compact;

(d) hot pressing the green compact;

(e) working the hot pressed compact to a shaped product and;

(f) heat treating the shaped product to provide a final product having coarse grains in a fine grain structure having improved resistance to fatigue crack growth.

4,693,748

COMPOSITION FOR STAINING MATERIAL

Shigeyoshi Kobayashi, Kawasaki; Tsuneo Manabe, and Ichiro Yanagisawa, both of Yokohama, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Sep. 29, 1986, Ser. No. 912,514

Int. Cl.[4] C09K *3/00*; A61K *8/00*

U.S. Cl. 106—35 **4 Claims**

1. A composition for a calcium phosphate type staining material, which is composed of Ca and P at their atomic ratio (Ca/P) in a range of from 0.05 to 0.33; and 5 to 28 mol % of Al_2O_3.

4,693,749

CEMENT REINFORCEMENT

David M. Gale, Wilmington, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Dec. 20, 1985, Ser. No. 811,843

Int. Cl.[4] C04B *7/02*

U.S. Cl. 106—99 **9 Claims**

1. A coated fiber useful for cement product reinforecment comprising fiber from poly-p-phenyleneterephthalamide or copolymers thereof consisting of at least 75 mole % of p-phenyleneterephthalamide units and up to 25 mol % of p-phenylene-2,6-naphthalamide units, coated with an alkyl titanate or a titanium chelate compound.

5. A composition for reinforcement of cement products comprising a fiber from poly-p-phenyleneterephthalamide or copolymers thereof consisting of at least 75 mole % of p-phenyleneterephthalamide units and up to 25 mole % of p-phenylene-2,6-naphthalamide units, said fiber being coated with an alkyl titanate or a titanium chelate compound, and an amount of pulp of oriented polyethylene fibrids equal to from 0.01 to 100 times the amount of coated fiber on a weight basis.

4,693,750

DIRECT TABLETTING AGENT

Kurt H. Bauer, Freiburg; Bernd Pritzwald-Stegmann, and Werner Luft, both of Reitmehring, all of Fed. Rep. of Germany, assignors to Meggle Milchindustrie GmbH & Co. KG., Wasserburg, Fed. Rep. of Germany

Filed Feb. 21, 1986, Ser. No. 831,598

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 3506276

Int. Cl.[4] A61K *9/20*

U.S. Cl. 106—163.1 **16 Claims**

1. A direct tabletting agent, consisting essentially of a mixture of lactose and cellulose with a ratio of lactose to cellulose by weight, of from 95 to 40:5 to 60, the lactose being present partly in crystalline and partly in amorphous form and the cellulose being present as finely-divided powder and a conventional additive selected from the group consisting of a disintegration agent, an aromatising agent, a stabilizer, a filling agent, a coloring material, a lubricant and a combination thereof or said mixture of lactose and cellulose without the conventional additive.

4,693,751

TITANIUM DIOXIDE SUSPENSION FOR USE IN FILM COATING

Patrick Den Boer, Glen Rock, and Richard F. Heinze, Bridgewater, both of N.J., assignors to Crompton & Knowles Corporation, New York, N.Y.

Continuation of Ser. No. 643,550, Aug. 23, 1984, abandoned. This application Feb. 7, 1986, Ser. No. 827,655

Int. Cl.[4] C08L *5/00*

U.S. Cl. 106—209 **1 Claim**

1. A composition for an aqueous pigment suspension useful in film coating, consisting essentially by weight of 50 percent titanium dioxide pigment, about 0.005 to 5 percent xanthan gum, and about 50 percent water.

4,693,752

COATING GRADE ASPHALT

Samir F. Elias, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 17, 1986, Ser. No. 853,258

Int. Cl.[4] C08L *95/00*

U.S. Cl. 106—280 **9 Claims**

1. An asphalt-based composition suitable for use as coating grade asphalt comprising an air-blown blend of (a) 90–50% by weight of hard asphalt flux and (b) 10-50% by weight of a vacuum distilled residue by vacuum distilling the product obtained by the hydrogenation of hard asphalt flux, said residue having a flash point above 500° F., the hard asphalt flux (a) and (b) being such that cannot normally be air-blown to meet coating grade specifications for softening point and penetration whereas said composition is capable of meeting coating grade asphalt specifications for softening point and penetration and has a softening point in the range of 200–235° F. and a penetration of 14–22.

4,693,753

PIGMENTS OF THE QUINACRIDONEQUINONE SERIES, PROCESS FOR THEIR PREPARATION AND THEIR USE

Ernst Spietschka, Idstein, and Frank Prokschy, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

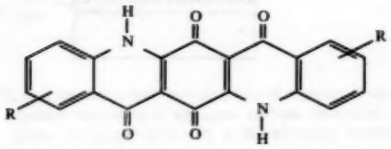
Filed Sep. 9, 1986, Ser. No. 905,672

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1985, 3532343

Int. Cl.[4] C04B *14/00*

U.S. Cl. 106—288 Q 5 Claims

1. A pigment of the quinacridonequinone series comprising 99–30 mole percent of a quinacridonequinone of the formula (1)

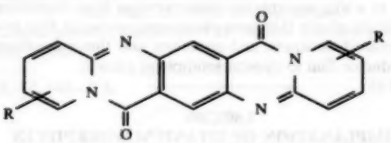


(1)

in which R denotes a hydrogen or chlorine atom or a methyl group, 0–60 mole percent of a quinacridone of the formula (2)

(2)

in which R has the abovementioned meaning, and 1–10 mole percent of a 7,15-dihydro-pyrido-(2,1-b)-(1',2'; 1,2)-pyrimido-(4,5-g)-quinazoline-7,15-dione of the formula (3)



(3)

in which R has the abovementioned meaning, the added compounds of the formulae (2) and (3) being present in the crystal lattice of the quinacridonequinone of the formula (1).

4,693,754

ALUMINUM PARTICLES RESISTANT TO REACTION WITH WATER

Tom Kondis, 842 Stevendale Dr., Pittsburgh, Pa. 15221

Continuation-in-part of Ser. No. 705,059, Feb. 26, 1985, abandoned, which is a continuation of Ser. No. 420,447, Sep. 20, 1982, abandoned. This application Mar. 7, 1985, Ser. No. 709,391

Int. Cl.[4] C04B *14/34;* C09C *1/62*

U.S. Cl. 106—290 26 Claims

1. A process comprising treating aluminum particles in the form of a slurry in the presence of a water-miscible organic liquid, a minor quantity of water, and an inorganic reagent capable of protecting the aluminum particles against subsequent attack by water, steam, or corrosive aqueous solutions, said inorganic reagent being one selected from the group consisting of the compounds of chromium and vanadium and being present at a concentration of about 1% to about 33% by weight on the weight of aluminum particles treated.

4,693,755

METHOD AND COMPOSITION FOR REMOVING ASBESTOS-CONTAINING MATERIALS

Bradley F. Erzinger, 6003 S. Logan St., Littleton, Colo. 80121

Filed Jun. 5, 1986, Ser. No. 871,454

Int. Cl.[4] B08B *7/00*

U.S. Cl. 134—4 3 Claims

1. A process for removing an asbestos-containing material from a substrate surface comprising the sequential steps of:

applying to the asbestos-containing material, a composition comprised of from about 1 to about 30 percent by weight of a cellulosic polymer and from about 99 to about 70 percent by weight of a liquid carrier;

allowing the resulting gel-like composition sufficient time to penetrate the asbestos-containing material and form a wet asbestos-containing/cellulosic polymer substance;

subjecting the wet asbestos-containing/cellulosic polymer substance to mechanical forces selected from the group consisting of scraping, chiseling, impacting, scoring, shearing and vacuuming to separate the wet asbestos-containing/cellulosic polymer substance from its substrate surface and;

collecting the resulting asbestos-containing debris for disposal.

4,693,756

METHOD AND RETORT FOR THE REMOVAL OF CARBONIZABLE COATINGS FROM THE SURFACES OF METAL OBJECTS

Horst D. Schlick, Metelen, Fed. Rep. of Germany, assignor to Schlick Roto-Jet Maschinenbau GmbH, Metelen, Fed. Rep. of Germany

Filed Jun. 26, 1985, Ser. No. 749,004

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1984, 3426242

Int. Cl.[4] B08B *7/00;* B24B *1/00;* F23J *00/00*

U.S. Cl. 134—7 9 Claims

1. A method for the removal of carbonizable, adherent coatings from the surfaces of metal objects, in which the coatings on the metal objects are carbonized or pyrolyzed in the course of the method, comprising:

bringing one or more metal objects having one or more carbonizable, adherent coatings on one or more surfaces thereof in a substantially closed retort to the carbonizing temperature; and,

heating a blasting medium at least to a temperature so high that the temperature within the retort does not diminish below the temperature required for carbonizing within the retort;

without the one or more metal objects leaving the retort, utilizing the heated blasting medium to blast off the one or more adherent, carbonized coatings at least after the beginning of the carbonization.

4,693,757

PARTICULAR METHOD FOR TREATING ARTICLES MADE OF CORK

Modeste Sabaté, Rue Clémenceau, 66160 Le Boulou, and Joël Massé, 17 rue Aristide Maillol, 66410 Villelongue de la Salanque, both of France

Filed Feb. 19, 1985, Ser. No. 703,177

Claims priority, application France, Dec. 19, 1984, 84 19448

Int. Cl.[4] B08B *3/04*

U.S. Cl. 134—27 13 Claims

1. A method for treating cork plug articles comprising the steps of:

washing the cork plug articles in a first washing medium comprising a basic aqueous solution at a first concentra-

tion between 5 and 200 g/l for a time sufficient to effect degradation of lignin in said cork plug articles;

washing the basic solution treated cork plug articles in a second washing medium comprising a basic aqueous solution at a second concentration between 0.5 and 20 g/l, said second concentration being lower than said first concentration, for a time sufficient to eliminate a substantial part of the lignin degraded in the first washing medium;

treating the second washed cork plug articles in a third medium comprising a concentrated peroxide solution having a third concentration between 20 and 400 g/l, said third concentration being higher than the first concentration, for a time sufficient to achieve disinfection of the cork plug articles after drying thereof; and

drying the cork plug articles.

4,693,758

METHOD OF MAKING DEVICES IN SILICON, ON INSULATOR REGROWN BY LASER BEAM

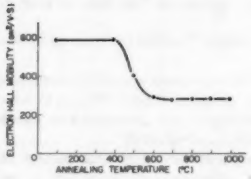
Yutaka Kobayashi, Hitachi, and Takaya Suzuki, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 275,128, Jun. 18, 1981, abandoned. This application Oct. 4, 1985, Ser. No. 784,033

Claims priority, application Japan, Jun. 18, 1980, 55-81420

Int. Cl.[4] H01L *21/263, 21/225*

U.S. Cl. 437—174 **27 Claims**



1. A method of forming a single crystalline semiconductor layer comprising the steps of:

(a) depositing a layer of semiconductor material on a main surface of an insulating substrate, said layer of semiconductor material comprising an interface sublayer adjacent said main surface of the insulating substrate and a single crystalline semiconductor sublayer formed continuously on the interface sublayer, the single crystalline semiconductor sublayer having an exposed surface not adjacent the interface sublayer, said interface sublayer being made up of an aggregate of single crystalline semiconductor grains, said single crystalline semiconductor sublayer having a predetermined orientation and

(b) irradiating a portion of said single crystalline semiconductor sublayer with an electromagnetic wave which has energy and a wavelength required to re-grow said portion substantially uniformly, from the exposed surface of said single crystalline semiconductor sublayer; said portion being all of said single crystalline semiconductor sublayer other than a seed layer part of said single crystalline semiconductor sublayer, adjacent said interface sublayer, that is necessary for serving as a seed of the re-growth.

4,693,759

METHOD OF FORMING A THIN SEMICONDUCTOR FILM

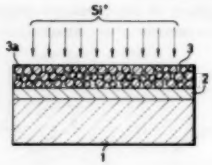
Takashi Noguchi; Hisao Hayashi, and Takefumi Ohshima, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

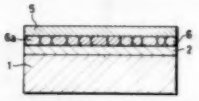
Filed Nov. 25, 1985, Ser. No. 801,319

Claims priority, application Japan, Nov. 26, 1984, 59-249406; Nov. 30, 1984, 59-252882

Int. Cl.[4] H01L *21/20, 21/263*

U.S. Cl. 437—24 **5 Claims**





1. A method of forming a thin semiconductor film, comprising the steps of: forming a thin semiconductor film on a predetermined substrate; implanting predetermined dopant ions in said thin semiconductor film to convert said thin semiconductor film to a thin amorphous semiconductor film; decreasing the thickness of said thin amorphous semiconductor film to a predetermined thickness; and annealing said thin amorphous semiconductor film to cause a solid-phase growth.

4,693,760

ION IMPLANATION OF TITANIUM WORKPIECES WITHOUT SURFACE DISCOLORATION

Piran Sioshansi, Bedford, Mass., assignor to Spire Corporation, Bedford, Mass.

Filed May 12, 1986, Ser. No. 861,845

Int. Cl.[4] C23C *11/10*

U.S. Cl. 148—4 **9 Claims**

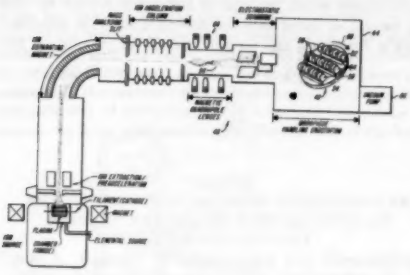
1. A process for preventing surface discoloration of workpieces formed of titanium and its alloys during their ion implantation wherein a plurality of workpieces are exposed to an ion beam in series so as to improve their wear performance comprising:

(a) exposing all titanium fixtures and shields mounted within an implant chamber prior to each ion implantation to an ion beam so as to cleanse them of surface contamination and to form a surface layer thereon having a sputtering coefficient lower than that of titanium;

(b) creating a vacuum within said implant chamber not exceeding about 5×10^{-5} torr; and

(c) introducing a workpiece formed of titanium and its alloys into said implant chamber to be secured therein by said cleansed and surface layer coated titanium fixtures and exposing said workpiece to a direct line of said ion beam while shielding areas thereof not being treated;

(d) said ion beam having an ion beam power density on the surface of said workpiece not exceeding about 1.0 watt/cm^2;



(e) said ion beam incorporating one of a group of elemental species consisting of nitrogen, carbon, chromium, zirconium, oxygen, boron, tin, iron, tantalum, molbdenum, neon, argon, krypton and xenon.

4,693,761

PROCESS AND DEVICE FOR HANDLING WORKPIECES, ESPECIALLY FOR THE THERMAL SEPARATION OF PROFILES WITH A CUTTING TORCH

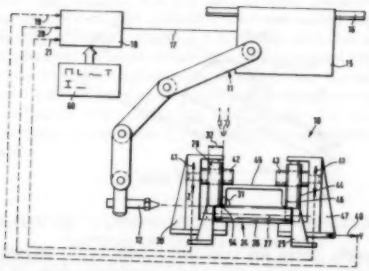
August Bohm, Kelkheim; Gerhard Lentz, Niedernhausen, and Gunter Wilkens, Kelkheim, all of Fed. Rep. of Germany, assignors to Oxytechnik, Fed. Rep. of Germany

Filed Mar. 13, 1986, Ser. No. 839,223

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510381

Int. Cl.^{4} B23K *7/10*

U.S. Cl. 148—9 R **15 Claims**



1. In a process for handling workpieces, such as for the thermal cutting of profiles with a cutting torch which is guided according to the contour of a workpiece by a control unit, the improvement being in storing the workpiece contour variably in the control unit, determining the absolute values of the profile to be processed by means of measuring devices in the vicinity of the profile, and transmitting the absolute values to the the control unit for determing the actual workpiece contour and for determining the control signals for the torch.

4,693,762

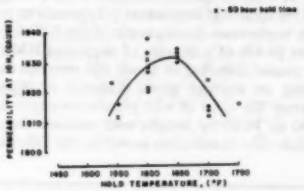
PROCESSING FOR CUBE-ON-EDGE ORIENTED SILICON STEEL

Frank A. Malagari, Jr., Freeport, Pa., assignor to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 510,844, Jul. 5, 1983, abandoned. This application Aug. 8, 1985, Ser. No. 763,885

Int. Cl.^{4} H01F *1/04*

U.S. Cl. 148—111 **11 Claims**



1. In a process for producing electromagnetic silicon steel having a cube-on-edge orientation, which process includes the steps of preparing a steel melt containing 2.5 to 4% silicon, casting the steel, hot rolling the steel, cold rolling the steel to final gauge, decarburizing the steel, applying a refractory oxide base coating to the steel, and final texture annealing the steel by heating to and maintaining a temperature in excess of 2000° F., the improvement comprising the steps of

during final texture annealing, heating the steel to a recrystallization temperature within the range of 1600° to 1700° F.;

heating the steel at about 10° F./hour or less in the recrystallization temperature range at temperatures depending upon the thickness of the steel with higher temperatures for thinner steel for about 6 to 20 hours to substantially complete secondary recrystallization; and

heating the steel from the selected recrystallization temperature range to a temperature in excess of the 2000° F., said steel having improved magnetic permeability and core loss values.

4,693,763

WET LOADING EXPLOSIVE

Cyrus A. Ross, and Eberhard Thurow, both of Kirkland Lake, Canada, assignors to Les Explosifs Nordex Ltee/Nordex Explosives Ltd., Kirkland Lake, Canada

Filed Dec. 24, 1986, Ser. No. 945,892

Int. Cl.^{4} C06B *45/34*

U.S. Cl. 149—8 **24 Claims**

1. A water resistant explosive composition comprising:

(i) approximately 4.3% to 27% by weight of an oil/glycol emulsion including 1% to 6% by weight of an immiscible emulsifiable liquid oil, 0.3% to 5% by weight of an emulsifier and 3% to 16% by weight of a glycol, said emulsion having a density equal to or greater than water;

(ii) approximately 70% to 95% by weight of an oxidizing salt coated with said oil/glycol emusion to impart water resistance to the granules;

(iii) approximately 0.7% to 3.0% by weight of a hydratable self-complexing gelling agent; and

(iv) approximately 0% to 12% by weight of water.

4,693,764

CONTROL OF PROCESSIBILITY BY PARTICLE SIZE IN HIGH ENERGY SOLID PROPELLANTS

Donald D. Curtis, San Jose, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 18, 1986, Ser. No. 909,362
Int. Cl.[4] C06B *45/10*
U.S. Cl. 149—19.4 **1 Claim**

1. A solid propellant comprised on a weight basis of about 15.15% hydroxyl terminated polybutadiene polymer combined with isophorone diisocyanate; about 0.05% carbon black; and about 84.8% of a mixture of unground HMX having an average means diameter of about 150 microns and ground HMX, having an average mean diameter of about 8–16 microns, wherein the ratio of said ground to unground HMX is from 60:40 to 70:30 by weight and wherein the composite HMX particle size distribution is within the following limits:

Percent greater than	Nom. particle size, μ
7 ± 7	300
18 ± 12	200
47 ± 10	100
57 ± 9	70
65 ± 7	40
68 ± 6	30
71 ± 7	20
77 ± 10	10
88 ± 6	4
95 ± 5	2

4,693,765

GEL TYPE SLURRY EXPLOSIVE AND MATRIX AND METHOD FOR MAKING SAME

Donald M. Stromquist, Thirty-three C St., Salt Lake City, Utah 84103, and Boyd J. Wathen, 135 W. 740 North, American Fork, Utah 84003

Filed May 22, 1986, Ser. No. 866,455
Int. Cl.[4] C06B *36/30*
U.S. Cl. 149—60 **24 Claims**

1. A non-explosive matrix composition to be added to an ammonium nitrate-fuel oil explosive mixture to form a slurry explosive, comprising an oxidizer solution selected from the group consisting of an aqueous sodium perchlorate solution, an aqueous ammonium perchlorate solution, an aqueous calcium nitrate solution, or a combination thereof; a thickening agent; and a fuel which serves as a dispersing agent for the thickening agent, the water and other ingredient content of the matrix being such as will make the matrix effective, when mixed with standard ammonium nitrate-fuel oil dry explosive in the range of about 14% to 40% matrix by weight, to produce a slurry explosive.

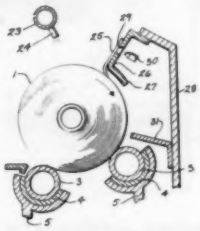
4,693,766

HIGH SPEED TAIL SEALING APPARATUS

Nelson R. Stauffer, Factoryville, Pa., assignor to Karnel Corporation, Clarks Summit, Pa.

Filed Sep. 18, 1985, Ser. No. 777,192
Int. Cl.[4] B65H *81/00*
U.S. Cl. 156—64 **7 Claims**

1. An improved high speed apparatus for sealing the tail of a roll product, comprising a supporting structure defining a tail separating station and a wind-up station, said supporting structure including a pair of generally parallel rollers that define said tail separating station and said tail wind-up station, said stations being disposed longitudinally of said rollers, drive means for rotating the roll about its axis at the tail separating station, tail separating means disposed at the tail separating station for separating the tail from the body of the roll as the roll is rotated, tail support means disposed downstream in the direction of rotation of said roll from said tail separating means and including a supporting surface to support the separated tail, sensing means associated with said tail support means for sensing the end of the tail as the tail is drawn over said surface by continued rotation of said roll, said sensing means being connected to the drive means and operable to stop rotation of the drive means when the end of the tail is sensed by said sensing means, an apron disposed downstream in the direction of rotation from said tail support means for supporting the



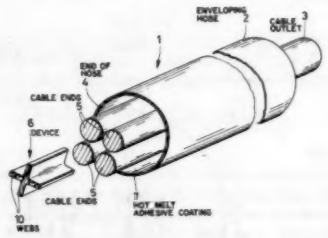
separated tail after the tail is drawn over said tail support means, conveying means for moving the roll with the separated tail from the tail separating station to the wind-up station, adhesive applying means mounted at a level above the apron for applying a strip of adhesive to the separated tail as the roll is moved to the wind-up station, and means for rotating the roll at the wind-up station to rewind the tail onto the body of the roll.

4,693,767

CABLE SLEEVE WITH A DEVICE CROSS-SHAPED IN CROSS-SECTION FOR SUPPORT OF CABLE ENDS ENTERING THE CABLE SLEEVES

Ortwin Grzanna, Essen; Manfred Koesfeld, Wetter; Rolf-Udo Weber, Muelheim; Aloysius Steuer, Essen; Horst Romswinkel, Gelsenkirchen; Dieter Fremgen, Wuelfrath, and Dieter Kastrop, Herdecke, all of Fed. Rep. of Germany, assignors to Walter Rose GmbH & Co. KG, Hagen, Fed. Rep. of Germany

Filed Jan. 13, 1986, Ser. No. 818,256
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1985, 3501243; Jun. 14, 1985, 3521366
Int. Cl.[4] H01R *43/00*; H02G *15/08*
U.S. Cl. 156—49 **9 Claims**



1. A cable sleeve for covering a cable splice formed by cables having ends, comprising an enveloping hose of heat shrinkable material, a hot melt adhesive coating covering at least some portions of the inside surface of the hose, and at least one device cross-shaped in cross-section for insertion between and support of cable ends to be entered into the cable sleeve wherein the device is a molded piece of hot melt adhesive and wherein the fusion point of the hot melt adhesive of the device is below the fusion point of the hot melt adhesive of the coating.

8. A process for covering a cable splice formed by cables

having ends, comprising the steps of inserting a cross-shaped device of hot melt adhesive between cable ends to be spliced, placing an enveloping hose having an inside coating of hot melt adhesive over the cable ends, and fixing the device in position by applying heat to the hose, wherein the fusion point of the hot melt adhesive of the device is lower than the fusion point of the material of the inside coating of the hose, applying further heat until the fusion point of the hot melt adhesive of the coating is exceeded so that the hot melt adhesive of the coating fills the cavities existing between the cables and the hot melt adhesive of the coating is prevented by the device from exiting out from between the cables at the end of the hose.

4,693,768

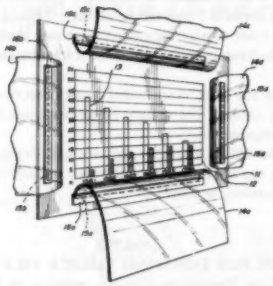
ART PRODUCTION METHOD UTILIZING CAST COATED PAPER FOR PREPARATION OF CAMERA-READY ART

Wayne L. Caster, 2908 Mockingbird La., Bloomington, Ill. 61701, assignor to Wayne L. Caster, Bloomington, Ill.

Filed Aug. 14, 1985, Ser. No. 765,913

Int. Cl.[4] B32B *31/12*

U.S. Cl. 156—62 **4 Claims**



1. In the process of producing commercial art work using an art production board with a surface to which inked indicia are applied and having one or more clear overlays juxtaposed to said board surface and to one another and with each overlay being detachably mounted on said board surface by suitable adhesive means, the improved step of employing as said board a cast-coated paper having a clay coating exhibiting a glossy surface of such hardness that chalking of the surface is not a problem and clogging of a pen used to apply inked indicia to the surface presents no difficulty, said cast-coated paper also possessing sufficient strength and durability such that errors in the application of inked indicia to said cast-coated paper surface may be readily corrected by scraping away the undesired material without marring the surface and whereby removal of said adhesive means mounting said overlays on said cast-coated paper surface also will not mar the cast-coated paper surface.

4,693,769

METHOD OF MANUFACTURING A COMBINATION OF SYNTHETIC RESIN ELEMENTS

Johannes H. Fritz, and Renaat E. Van de Leest, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

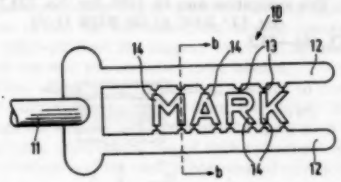
Filed Apr. 22, 1985, Ser. No. 725,868

Claims priority, application Netherlands, May 22, 1984, 8401628

Int. Cl.[4] B29C *37/02, 65/08;* B32B *31/14*

U.S. Cl. 156—73.1 **5 Claims**

1. A method of providing a substrate with a plurality of separate synthetic resin display elements attached thereto in a desired arrangement, each of said display elements being provided with a plane surface suitable for attaching said display element to said substrate and at least one conspicuous surface situated away from said plane surface, said method comprising forming, by molding, a unitary body consisting essentially of said plurality of synthetic resin display elements in said desired arrangement, a synthetic resin carrier and synthetic resin connecting members, each of said connecting members being



detachably joined to said synthetic resin display elements and each of said connecting elements being joined to said carrier, fully metallizing the conspicuous surfaces of said display elements, positioning said body on said substrate so that only said plane surfaces are in contact with said substrate, attaching said thus positioned body to said substrate only at said plane surfaces and detaching said connecting members and the carrier connected thereto from said synthetic resin display elements.

4,693,770

METHOD OF BONDING SEMICONDUCTOR DEVICES TOGETHER

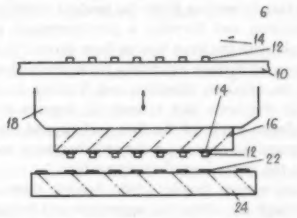
Kenzo Hatada, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 24, 1986, Ser. No. 877,967

Claims priority, application Japan, Jul. 5, 1985, 60-148908

Int. Cl.[4] C25D *5/48*

U.S. Cl. 156—151 **16 Claims**



1. A method of fabricating a semiconductor device comprising the steps of:

conducting alignment of a metal bump and an electrode of a first semiconductor device, said metal bump being formed on a substrate;

pressing the electrode of the first semiconductor device to said metal bump on the substrate and removing the metal bump from said substrate so that said metal bump is joined to said electrode of the first semiconductor device;

conducting alignment of the metal bump joined to the first semiconductor device and an electrode of a second semiconductor device; and

pressing the metal bump to the electrode of the second semiconductor device so that the electrodes of said first and second semiconductor devices are joined together.

6. The method of fabricating a semiconductor device of claim **1**, wherein resin layer is formed on said metal bump to be joined to the electrode of said first semiconductor device.

8. The method of fabricating a semiconductor device of claim **1**, wherein said substrate has an opening at a position corresponding to the electrode of the semiconductor device and said bump is formed at the opening by electro-plating.

4,693,771

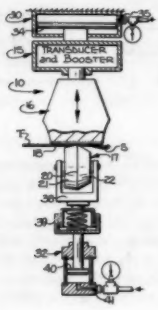
WOVEN TEXTILE FABRIC HAVING AN ULTRASONICALLY CUT AND SEALED EDGE AND APPARATUS AND PROCESS FOR PRODUCING SAME

George L. Payet, Fort Mill, and Stephen C. Ballard, Lancaster, both of S.C., assignors to Springs Industries, Inc., Fort Mill, S.C.

Division of Ser. No. 555,664, Nov. 28, 1983, Pat. No. 4,534,819. This application Apr. 10, 1985, Ser. No. 721,719

Int. Cl.[4] B29C *65/08;* B32B *31/18*

U.S. Cl. 156—73.3 9 Claims



1. Process for ultrasonically cutting and sealing woven textile fabric to produce a clean and sharp sealed edge of a thickness no greater than the thickness of the textile fabric and having a desired wash durability without significant raveling with an ultrasonic apparatus including a vibrating sonic horn having a flat working face and an anvil positioned for contact by the vibrating horn; said process comprising the steps of:

providing an anvil defining a peaked cutting edge, a first surface extending from the peaked cutting edge in a first direction and forming a predetermined included acute angle with the horn face of from about 3 to 20 degrees and a second surface extending from the peaked cutting edge in the opposite direction and forming an included angle with the horn face at least 2½ degrees greater than the included angle of the first surface and no more than 45 degrees for forming a desired sharpness and for reinforcing the peaked anvil cutting edge;

passing woven textile fabric having thermoplastic fibers through the ultrasonic apparatus and between the vibrating sonic horn and the anvil at a substantially constant predetermined rate of speed and in a generally linear path of travel substantially parallel to either the warp or the filling yarns of the fabric and with the peaked cutting edge of the anvil and positioned so that the edge of the fabric to be sealed is passed over the first surface of the anvil;

cutting an edge through the textile fabric substantially parallel with either a warp or a filling yarn which is parallel to the path of travel of the fabric through the ultrasonic apparatus by vibrations of the sonic horn against the peaked cutting edge of the anvil;

simultaneously sealing the cut edge of the fabric by fusing and bonding a mass of thermoplastic fibers in the fabric adjacent to and extending inwardly of the fabric from the cutting edge from about 0.01 to 0.10 inch and encompassing from about 2 to 4 of either the warp or filling yarns extending parallel to the cut edge by vibrations of the sonic horn toward the first surface of the anvil; and

applying a predetermined pressure to the anvil and to the vibrating sonic horn for exerting predetermined forces on the fabric passing therebetween for aiding in the ultrasonic cutting and sealing.

4,693,772

HOT APPLIED, EXPANDABLE SEALER

William A. Douglas, Richmond Heights, Mo., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Division of Ser. No. 787,343, Oct. 15, 1985. This application Dec. 22, 1986, Ser. No. 945,144

Int. Cl.[4] B32B *5/18*

U.S. Cl. 156—79 1 Claim

1. A method of producing a thermosetting seal between two or more surfaces comprising pumping a heated selant comprising:

about 10 percent to about 25 percent by weight of styrene-butadiene rubber, about 5 percent to about 20 percent by weight of a thermosplastic resin, about 0.5 percent to about 3 percent by weight of an accelerator activator, to about 0.2 percent by weight to about 0.75 percent by weight of a vulcanizing agent, about 25 percent by weight to about 35 percent by weight of a plasticizer, about 20 percent by weight to about 60 percent by weight of filler, about 0.5 percent by weight to about 2 percent by weight of a blowing agent, about 1 percent to about 10 percent by weight of a thickening agent about 4 percent to about 40 percent by weight of an oil or plasticizer, said composition having a sulfonamide accelerator present at concentrations of about 0.5 percent to about 3.0 percent by weight, onto at least one surface of at least one component;

cooling the heated sealant to cause it to substantially crystallize;

contacting the first component with a second component thereby causing the sealant to be positioned between the two components;

heating the entire assembly to cure and expand the sealant causing the space between the two surface to be filled by the expanding sealant.

4,693,773

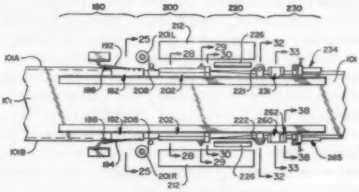
METHODS FOR FORMING VISIBLE FILE POCKETS

Alan F. Davies, Vancouver, Canada, assignor to Davies Office Equipment, Ltd., Vancouver, Canada

Division of Ser. No. 461,537, Jan. 27, 1983. This application Feb. 13, 1985, Ser. No. 701,113

Int. Cl.[4] B29C *53/00;* B31F *1/00*

U.S. Cl. 156—200 28 Claims



1. The method of forming a generally rectangular visible file pocket of the type having first and second transverse parallel edges and at least two pocket tips defined by first and second turned over edges formed integrally with and respectively disposed on the front and back thereof adjacent at least one of the two edges, comprising the steps of:

(a) positioning a first rectangular ply of polymeric material adjacent a second rectangular ply of polymeric material with the first and second plies of polymeric material having heat-bondable surfaces formed thereon and disposed in face-to-face relation;

(b) applying a heat-sealing effective temperature and pressure to the first and second plies of polymeric material to form a unitary laminar central web having an unlaminated, unbonded, longitudinally extending edge portion adjacent at least one of first and second transverse parallel edges thereon and a longitudinally extending

hinge pin receiving bore adjacent the other of the first and second parallel edges;

(c) heating and folding the unlaminated longitudinally extending edge portions defined by the first and second plies of polymeric material away from one another about their longitudinally extending junction with the unitary laminar central web through angles on the order of about 180°; and,

(d) cooling and setting the folded over, unlaminated, longitudinally extending edge portions in the folded over position to form first and second continuous, uninterrupted, longitudinally extending pocket tips respectively overlying and underlying the laminar central web along at least one of the first and second transverse parallel edges thereof.

4,693,774

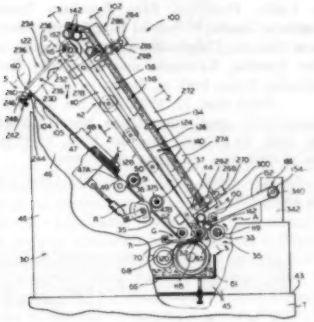
METHOD OF LABELING USING A SEMI-AUTOMATIC LABELING MACHINE

James G. Wesley, Cicero, Ill., assignor to Labelette Company, Forest Park, Ill.

Division of Ser. No. 657,980, Oct. 5, 1984, Pat. No. 4,626,314. This application May 15, 1986, Ser. No. 863,603

Int. Cl.⁴ B65C *1/20*; B32B *31/00*; B65G *47/00*

U.S. Cl. 156—215 **2 Claims**



1. In a method of labeling utilizing a semi-automatic labeling machine for consecutively applying discrete labels of the same predetermined size to each container of a run of round containers each of which is of the same predetermined size including external diameter, with the labeling machine including a label supply hopper having a downwardly sloping floor plate, a glue applying station, a labeling station including a pair of rotatable support rollers each having its longitudinal axis disposed normally of the path of movement of the individual labels from the supply hopper therefor through the stations, upon which machine support rollers round containers of a container run to be consecutively labeled may be manually consecutively applied on the side thereof to be supported and rotated about the longitudinal axis thereof by the machine support rollers when the latter are rotating, with the glue applying station including means for applying glue to the underside of the respective labels when received from the label supply station, and means for consecutively feeding the discrete labels londitudinally thereof along the feed path including one of said support rollers being in overlying relation to said feed path and a label feed guide mounted below the one support roller and including guide surfacing concentric with the periphery of the one support roller and disposed to direct the leading end of a label to be applied to the run container external side wall surfacing at a predetermined outfeed angle, with the one support roller being rotatable about a stationary axis and the other support roller being mounted for adjustment toward and away from the one support roller, to support and rotate containers of runs of such containers of variant diameters for label application run purposes and accommodate labeling containers of container runs made up of containers of all the same but variant container run sizes, and with the means for individually feeding the discrete labels for a run of such containers including means for individually feeding the label from the hopper through the glue applying station along the path of movement for application of glue thereto and then to label applying relation at the labeling station, and after one of the labels has been applied to consecutive of the run containers, the labeled container is manually removed from the support rollers to be manually replaced by the next run container to be labeled,

the method of operating the labeling machine to consecutively supply discrete labels from the supply hopper through the stations and consecutively apply such labels to cylindric objects of a run of such cylindrical objects each of which is of the same predetermined size including diameter, and each of wich is consecutively manually applied to the support rollers to disposed same in labeling position, and to effect automatic removal of the consecutive labeled cylindric objects from their labeling position on the support rollers by the manually placing of the next cylindric object to be labeled on the support rollers in the labeling position thereof, with the labels to be so applied to the cylindric objects of such run being each of the same predetermined size,

said method comprising:

establishing a feed path beginning at the labeling position and leading to a gravity discharge position remote from the labeling position,

rotating the machine support rollers and labelling the first run object with one of the labels in the labeling position of the object,

manually displacing the first object from the labeling position with the second object to be labeled by pressing the second object to be labeled against the said first object and thence into the labeling position and displacing the first object thereby into the feed path,

conveying the first object along the feed path while labeling the second object,

and thereafter, for the run of the cylindric objects to be labeled, consecutively manually displacing consecutively the cylindric objects that are labeled at the labeling position with the next consecutive object to be labeled by pressing the said next consecutive object to be labeled into the labeling position and thereby displacing the freshly labeled object into the feed path, and continuously conveying the consecutive freshly labeled objects along the feed path and gravity discharging same therefrom one by one while continuing to label at the labeling position the objects of the run of same to be consecutively labeled.

4,693,775

HOT MELT, SYNTHETIC, MAGNETIC SEALANT

Bruce L. Harrison, St. Louis, and Richard J. Wall, Florissant, both of Mo., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Mar. 6, 1986, Ser. No. 836,917

Int. Cl.⁴ B32B *31/00*

U.S. Cl. 156—272.4 **10 Claims**

6. A method for sealing an irregular surface using a hot melt, magnetized adhesive comprising

applying a strip of a hot melt, magnetized adhesive of a synthetic resin containing about 60 percent to about 80 percent by weight of magnetized particles having particle

sizes greater than 150 microns to a ferrometallic substate, heating the magnetic adhesive to cause the adhesive to

become compliant and drawn onto the substrate by the magnetic field forming a substantially void free seal.

4,693,776

MACROMER REINFORCED PRESSURE SENSITIVE SKIN ADHESIVE

Stephen E. Krampe; Cheryl L. Moore, and Charles W. Taylor, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 734,907, May 16, 1985, abandoned. This application Nov. 14, 1985, Ser. No. 797,851

Int. Cl.[4] **C09J** *5/00*

U.S. Cl. 156—327 **19 Claims**

1. A method of adhering a substrate to skin comprising the step of interposing between the substrate and the skin an adhesive composition comprising a copolymer of copolymerized A monomers, C macromers, and optionally B monomers, wherein:

A is a monomeric acrylate or methacrylate ester of a non-tertiary alcohol, said alcohol having from about 1 to about 14 carbon atoms with the average number of carbon atoms being from about 4 to about 12;

B, when used, is at least one ethylenically unsaturated compond copolymerizable with said A monomer, with B monomers comprising from about 0% to about 25% of the total weight of A and B monomers; and

C is a macromer having the general formula:

$$X-(Y)_n-Z$$

wherein:

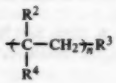
X is a vinyl group copolymerizable with said A and B monomers, X having the general formula:

wherein

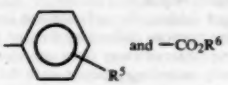
R is a hydrogen atom or a COOH group and R′ is a hydrogen atom or a methyl group;

Y is a divalent linking group with n being either 0 or 1; and

z is a monovalent polymeric moiety having a T_g greater than about 20° C. and a molecular weight in the range of about 2,000 to about 30,000 and being essentially unreactive under copolymerization conditions, Z having the general formula:



wherein R^2 is a hydrogen atom or a lower alkyl group, R^3 is a lower alkyl group, n is an integer from about 20 to about 500, and R^4 is a monovalent radical selected from the group consisting of:



wherein R^5 is a hydrogen atom or a lower alkyl group and R^6 is a lower alkyl group;

wherein the number and composition of said C macromers is such that the adhesive composition has a creep compliance of at least about 1.2×10^{-5} cm^2/dyne when measured after about 3 minutes of subjection to stress.

4,693,777

APPARATUS FOR PRODUCING SEMICONDUCTOR DEVICES

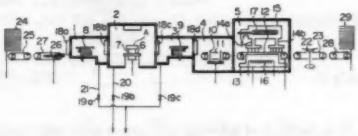
Shigeki Hazano, Yokohama, Japan; Masahiro Shibagaki, San Jose, Calif.; Hidetaka Jyo; Reiichiro Sensui, both of Sagamihara, Japan; Munenori Iwami, Yokohama, Japan, and Noboru Suzuki, Chigasaki, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Kabushiki Kaisha Tokuda Seisakusho, Zama, both of, Japan

Filed Nov. 27, 1985, Ser. No. 802,468

Claims priority, application Japan, Nov. 30, 1984, 59-253581; Nov. 30, 1984, 59-253582; Nov. 30, 1984, 59-253585; Nov. 30, 1984, 59-253589; Nov. 30, 1984, 59-253591

Int. Cl.[4] **B44C** *1/22;* **C23F** *1/02;* **C03C** *15/00*

U.S. Cl. 156—345 **49 Claims**



1. An apparatus for producing semiconductor devices comprising:

a dry etching unit for dry etching a material to be treated, said dry etching unit having an etching chamber in which said material to be treated is etched, an electrode for applying RF power to said material to be treated which is securely held in position, a gas introduction means for introducing etching gases into said etching chamber, a loading chamber communicating with said etching chamber for transferring the material to be treated into said etching chamber, and an unloading chamber communicating with said etching chamber for transferring the material to be treated from said etching chamber into said unloading chamber;

a heat-treatment unit for heat treating said material dry-etched, said heat-treatment unit having a transfer chamber communicating with said unloading chamber of said dry etching unit for transferring the material to be treated from said unloading chamber, a heat-treatment chamber communicating with said transfer chamber, and heating means disposed in said heat-treatment chamber for heating the material to be treated; and

a water cleaning unit with a chuck for cleaning said material heat-treated with water while said chuck holds in position and rotates said material.

4,693,778

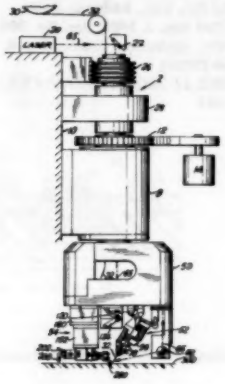
APPARATUS FOR MAKING SCRIBED CIRCUIT BOARDS AND CIRCUIT BOARD MODIFICATIONS

Brian E. Swiggett, Huntington; Ronald Morino, Sea Cliff; Raymond J. Keogh, Huntington, all of N.Y., and Jonathan C. Crowell, Lakeville, Mass., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Jul. 19, 1985, Ser. No. 756,690

Int. Cl.[4] B23K *26/02, 26/16;* B29C *65/16*

U.S. Cl. 156—361 21 Claims



1. An apparatus for scribing a conductor to a surface of a substrate in a predetermined pattern between two points on said surface, each of said points defining a terminal point, said conductor being coated with a coating which is non-tacky and non-blocking in its coated state but activatable to be an adhesive at the time the conductor is applied to said surface and to return to a non-tacky state after said conductor is fixed to said surface, said apparatus including means for feeding said coated conductor to the first of the pair of terminal points on said surface to be connected by said conductor, mean for supplying the end of said conductor to said first terminal point on said surface, tacking means comprising radiant heating means directed at a point on the conductor adjacent the terminal point to activate said adhesive coating to a tacky state and a tacker for fixing the supplied end of said conductor to said first terminal point prior to scribing a conductor path, means for moving said surface and said conductor feeding means relative to each other along a predetermined path from said first of said pair of terminal points to the second of said pair of terminal points, said radiant means activating said coating to an adhesive state as said conductor is applied to said surface, pressure means for urging said conductor with said activated adhesive coating into contact with said surface along said predetermined path, means for cutting the end of said conductor, means for applying said cut end of said conductor to said second of said terminal points and means for fixing said conductor end to said second terminal point.

19. An apparatus for scribing a conductor to a surface of a substrate in a predetermined pattern between two points on said surface, each of said points defining a terminal point, said conductor being coated with a coating which is non-tacky and non-blocking in its coated state but activatable to be an adhesive at the time the conductor is applied to said surface and to return to a non-tacky state after said conductor is fixed to said surface, said apparatus including means for feeding said coated conductor to the first of the pair of terminal points on said surface to be connected by said conductor, means for supplying the end of said conductor to said first terminal point on said surface, means for fixing the supplied end of said conductor to said first terminal point to scribe a conductor path, means for moving said surface and said conductor feeding means relative to each other along a predetermined path from said first of said pair of terminal points to the second of said pair of terminal points, means for activating said coating to an adhesive state as said conductor is applied to said surface, pressure means for urging said conductor with said activated adhesive coating into contact with said surface along said predetermined path, means for cutting the end of said conductor, means for applying said cut end of said conductor to said second of said terminal points and means for fixing said conductor end to said second terminal point in which said pressure means includes a wheel and means for bringing said pressure wheel into pressure contact with said conductor after said conductor has been applied comprising an indexing head and said means for fixing the applied end of said conductor to said first terminal point being mounted thereon, said indexing head including means for rotating said indexing head to a first position for engaging said fixing means with said conductor and into a second position for engaging said pressure wheel with said conductor.

4,693,779

MANUFACTURING APPARATUS FOR SEMICONDUCTOR DEVICES

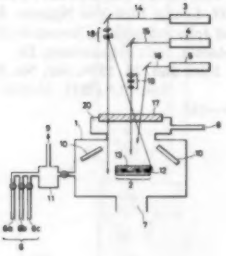
Hidekazu Okuhira, Kokubunji, and Yasuo Wada, Bunkyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 14, 1985, Ser. No. 798,113

Claims priority, application Japan, Nov. 14, 1984, 59-238570

Int. Cl.[4] C23F *1/02*

U.S. Cl. 156—638 8 Claims



1. A semiconductor device manufacturing apparatus comprising:

a reaction chamber;

a first light source means having at least one first light source for radiating light to a wafer disposed in said reaction chamber to induce photo-assisted reactions for performing a plurality of processes;

a gas introducing means for introducing gaseous reactants into said reaction chamber;

a gas exhausting means for exhausting the interior of said reaction chamber; and

a second light source means for removing by light irradiation undesirable gaseous constituents which adhere to said wafer and an inner wall of said reaction chamber.

4,693,780

ELECTRICAL ISOLATION AND LEVELING OF PATTERNED SURFACES

Gerhard Beil, Erding; Alfred Pichler, Gernlinden; Horst Pachonik, Taufkirchen, and Kurt Plehnert, Pullach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 12, 1986, Ser. No. 808,144

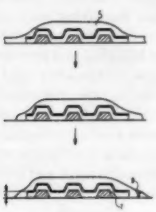
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 3506356

Int. Cl.[4] H01L *21/312*

U.S. Cl. 156—643 3 Claims

3. A method for electrically isolating and leveling at least

one exposed surface of a substrate having patterned conductive elements thereon for providing at least one additional surface thereon, the method comprising the steps of: first covering the one exposed surface of the substrate with an insulative material comprising an organic polymer of polyimide, and second covering and leveling the polyimide with another insulative material comprising a photoresist to form a substantially planar region over an area containing the patterned conductive elements and a tapering off portion between the planar region and edges of the substrate to form a predetermined slope angle between the tapering off portion and the substrate having a range of forty to sixty degrees.

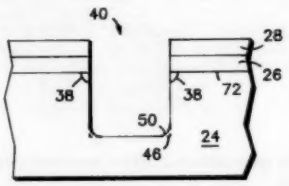


4,693,781

TRENCH FORMATION PROCESS

Howard K. H. Leung; Bich-Yen Nguyen; John R. Alvis, all of Austin, and John Schmiesing, Round Rock, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 26, 1986, Ser. No. 878,769
Int. Cl.[4] H01L *21/308*
U.S. Cl. 156—643 **14 Claims**



1. A process for fabricating a semiconductor device which comprises the steps of: providing a silicon substrate having a surface; forming a first oxide layer overlying said surface; patterning said first oxide to form an opening exposing a portion of said surface; implanting ions through said opening and into said surface to form a damaged surface region coincident with said opening and extending under said first oxide surrounding said opening; reactive ion etching said substrate exposed through said opening to form a trench extending into said substrate from said surface and extending below the damaged surface region; heating said substrate to grow a thermal second oxide on the walls of said trench and on said portion of said damaged surface region extending under said first oxide; and removing said thermal second oxide.

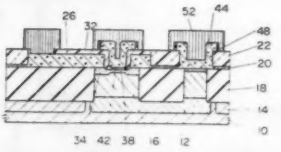
6. A process for fabricating a trench in a semiconductor substrate which comprises the steps of: providing a semiconductor substrate; forming an insulating layer overlying a surface of said substrate; patterning said insulating layer to form an opening therethrough exposing a portion of said surface; implanting ions through said opening and into said portion of said surface to form an implant damaged region, said damaged region extending laterally beneath said insulating layer around said opening; anisotropically etching said substrate exposed through said opening to form a trench extending into said substrate from said surface and through said implant damaged region and below it; oxidizing said substrate to form an oxide on the walls of said trench and on the portion of said damaged region extending laterally beneath said insulating layer; and subsequently removing said oxide.

4,693,782

FABRICATION METHOD OF SEMICONDUCTOR DEVICE

Kazuya Kikuchi, Hirakata; Tadao Komeda, Ikoma, and Tsutomu Fujita, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sep. 3, 1986, Ser. No. 903,132
Claims priority, application Japan, Sep. 6, 1985, 60-198075; Sep. 6, 1985, 60-198082
Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—653 **30 Claims**



1. A fabrication method of a semiconductor device comprising:

a step of forming a thin film pattern on a semiconductor substrate on which an antioxidation film is formed;

a step of etching said antioxidation film by using said thin film pattern as mask;

a step of forming a first semiconductor film pattern in the other region than said thin film pattern region;

a step of etching a desired region of said thin film pattern;

a step of forming an oxide film on the surface of said first semiconductor film pattern;

a step of etching said antioxidation film; and

a step of forming a second semiconductor film pattern in a desired region.

4,693,783

METHOD OF PRODUCING INTERCONNECTIONS IN A SEMICONDUCTOR INTEGRATED CIRCUIT STRUCTURE

Paul E. Poppert, Acton, and Marvin J. Tabasky, Peabody, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 31, 1984, Ser. No. 687,705
Int. Cl.[4] B23P *15/00, 25/06*
U.S. Cl. 156—644 **9 Claims**

1. The method of producing electrical interconnections between contact regions in a semiconductor integrated circuit structure comprising

providing a body of semiconductor material having a surface covered by a coating of adherent nonconductive protective material which contact regions interspersed therein;

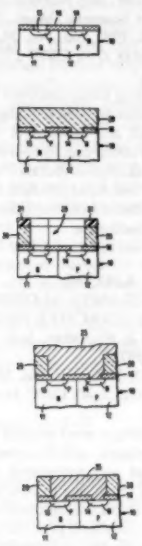
depositing a layer of adherent insulating material on said coating;

forming grooves in said layer of adherent insulating material in the desired pattern of electrical connections between contact regions to a depth to expose portions of said contact regions;

depositing conductive material on said body to fill said grooves and cover said layer of adherent insulating material; and

removing all the conductive material overlying the layer of adherent insulating material to expose the underlying

layer of adherent insulating material leaving said conductive material only filling the grooves and providing electrical connections in said desired pattern between contact regions.

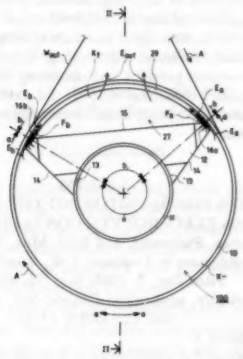


4,693,784

SUCTION ROLL AND METHOD FOR APPLYING A NEGATIVE PRESSURE OVER A SECTOR OF A ROLL

Jouko Aula, and Reima Kerttula, both of Jyväskylä , Finland, assignors to Valmet Oy, Finland

Filed Apr. 14, 1986, Ser. No. 851,480
Claims priority, application Finland, Apr. 17, 1985, 851533
Int. Cl.[4] D21F *3/10, 5/04*
U.S. Cl. 162—202 **25 Claims**



1. A method for applying a negative pressure over a suction sector of an air-pervious mantle of a roll, comprising the steps of:

providing a suction chamber within said pervious roll mantle to extend over said suction sector of said roll, said suction chamber having a pair of circumferentially spaced, axially extending outermost edge zones situated directly adjacent to and forming respective gaps with an inner surface of said pervious roll mantle, said outermost edge zones defining boundaries of said suction chamber;

directing air jets away from said suction chamber at said outermost edge portions of said suction chamber through said gaps, said gaps being sufficiently small so that said air jets cause air currents to be ejected from said suction chamber at said outermost edge zones thereof; and

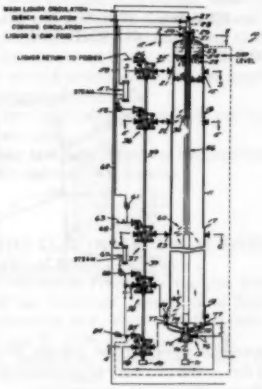
said air currents producing non-contacting air seals at said gaps at said outermost edge zones of said suction chamber and, at least partly, a negative pressure in said suction chamber.

4,693,785

DIGESTER HAVING PLURAL SCREENS AND MEANS FOR CONTROLLING THE LIQUID WITHDRAWAL

Oliver A. Laakso, Haralyn West, #2 Middle Road, Smiths Parish, Bermuda (3-18)

Division of Ser. No. 583,856, Feb. 27, 1984, Pat. No. 4,568,419.
This application Sep. 24, 1985, Ser. No. 779,443
Int. Cl.[4] D21C *3/26, 7/14*
U.S. Cl. 162—242 **7 Claims**



1. Digester for treating comminuted cellulosic material in suspension, comprising:

(a) a vertical vessel;

(b) means for introducing material entrained in liquid at the top of the vessel;

(c) means for discharging treated material at the bottom of the vessel;

(d) a plurality of sets of annular screen systems, each set vertically spaced from the other sets;

(e) at least four circumferentially spaced outlet nozzles associated with each screen set, each outlet nozzle operatively connected to a particular radial segment of the screen set with which it is associated and for withdrawing liquid only through radial segment, and radial segments of the various screen sets being substantially vertically aligned;

(f) withdrawal means for withdrawing liquid from through each of said screen sets, said withdrawal means including:

(g) valve means operatively connected to each of said nozzles associated with each of said screen systems; and

(h) means for controlling operation of said valve means so that liquid is withdrawn through the nozzles associated with vertically aligned radial segments of all of said screen sets at the same time, while no significant amount of liquid is withdrawn through the other nozzles associated with the screen sets at that time;

(i) a vertically extending central conduit disposed in said vessel for introducing treatment liquid into said vessel adjacent central points of said vessel, said conduit being substantially concentric with said vessel;

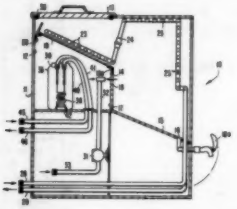
said valve means comprising, a plurality of valve members, a said valve member being associated with each screen set, each said valve member comprising a single valve body, an inlet to said valve body associated with each of said nozzles, a single rotary valve element mounted for rotation within said body, and a single outlet from said body and wherein said means for controlling operation of said valve means comprises a common operating member interconnecting each of said rotary valve elements and a drive mechanism for effecting movement of said common drive member.

4,693,786

NON-ELECTRICAL SOLVENT RECOVERY DISTILLATION APPARATUS

Dennis A. Brett, Carmel, and Clay R. Runshe, Indianapolis, both of Ind., assignors to Techserve Engineering Corp., Carmel, Ind.

Filed Jul. 2, 1985, Ser. No. 751,279
Int. Cl.[4] B01D *3/02*
U.S. Cl. 202—83 **15 Claims**



1. A portable, non-electrical solvent recovery distillation apparatus for on-site recovery of purified solvent from a batch of spent flammable solvent, comprising:

a tank having bottom and side walls and an open top;

a lid enclosing the open top of said tank and removable therefrom, said tank and lid including means for sealing in an air tight manner the interior of said tank;

a portable rigid container removably received within the interior of said tank to contain therein said batch of spent flammable solvent;

a non-electrical vacuum pump means for reducing the atmospheric pressure within said tank below ambient atmospheric pressure;

a non-electrical evaporating means, including a hot fluid conduit mounted within said tank and operable to circulate a hot fluid into indirect heat exchange relationship with the batch of spent flammable solvent contained within said rigid container, for evaporating said spent flammable solvent under reduced atmospheric conditions within said tank created by said vacuum pump means by heating said spent flammable solvent to its boiling point termperature, thereby separating purified solvent vapors from residual materials present in the spent flammable solvent; and

a non-electrical condensing means, including a cold fluid conduit operable to circulate cold fluid into indirect heat exchange relationship with said purified solvent vapors, for condensing within said tank the purified solvent vapors into a liquid form.

4,693,787

SEPARATION OF T-AMYL ALCOHOL FROM ISOBUTANOL BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. 3rd Ave., and Michael J. Shanahan, 8929 Gold Dust Trail, both of Bozeman, Mont. 59715

Filed Mar. 2, 1987, Ser. No. 20,350
Int. Cl.[4] B01D *3/40;* **C07C** *29/84*
U.S. Cl. 203—51 **2 Claims**

1. A method for recovering t-amyl alcohol from a mixture of t-amyl alcohol and isobutanol which comprises distilling a mixture of t-amyl alcohol and isobutanol in a rectification column in the presence of about one to two parts of extractive agent per part of t-amyl alcohol-isobutanol mixture, recovering the t-amyl alcohol as overhead product and obtaining the extractive agent and isobutanol from the stillpot, the extractive agent comprises dimethylsulfoxide.

4,693,788

SEPARATION OF T-AMYL ALCOHOL FROM ISOBUTANOL BY EXTRACTIVE DISTILLATION

Lloyd Berg, and Michael J. Shanahan, both of 1314 S. Third Ave., Bozeman, Mont. 59715

Filed Mar. 17, 1987, Ser. No. 26,451
Int. Cl.[4] B01D *3/40;* **C07C** *29/84*
U.S. Cl. 203—51 **4 Claims**

1. A method for recovering t-amyl alcohol from a mixture of t-amyl alcohol and isobutanol which comprises distilling a mixture of t-amyl alcohol and isobutanol in a rectification column in the presence of about one to two parts of extractive agent per part of t-amyl alcohol-isobutanol mixture, recovering the t-amyl alcohol as overhead product and obtaining the extractive agent and isobutanol from the stillpot, the extractive agent comprises dimethylformamide.

4,693,789

SEPARATION OF ISOPROPYL ACETATE FROM ISOPROPANOL BY EXTRACTIVE DISTILLATION

Lloyd Berg, and An-I Yeh, both of 1314 S. Third Ave., Bozeman, Mont. 59715

Filed Mar. 5, 1986, Ser. No. 836,488
The portion of the term of this patent subsequent to Jun. 25, 2002, has been disclaimed.
Int. Cl.[4] B01D *3/40;* **C07C** *67/48*
U.S. Cl. 203—51 **9 Claims**

1. A method for recovering isopropyl acetate from a mixture of isopropyl acetate, isopropanol and water which comprises distilling a mixture of isopropyl acetate, isopropanol and water in a rectification column in the presence of about one to two parts of an extractive agent per part of isopropyl acetate-isopropanol-water mixture, recovering isopropyl acetate and water as overhead product and obtaining the extractive agent and isopropanol from the stillpot, the extractive agent comprises at least one amino alcohol containing from two to six carbon atoms.

4,693,790

METHOD FOR MONITORING THE QUALITY OF $ZNSO_4$ ELECTROLYTE CONTAINING SB (V)

Ian H. Warren, Richmond, and Felix Mok, Vancouver, both of Canada, assignors to Cominco, Ltd., Vancouver, Canada

Filed Dec. 5, 1985, Ser. No. 805,297
Claims priority, application Canada, Sep. 12, 1985, 490589
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—1 T **16 Claims**

1. A method for controlling a process for the electrolytic recovery of zinc using a zinc sulfate electrolyte containing concentrations of impurities, including pentavalent antimony, and at least one polarization affecting agent, said method comprising the steps of:

(i) establishing a test circuit comprising in combination a test cell, a sample of electrolyte, an elongated moving cathode made of an electrolytically conductive material on which

zinc is deposited, which moving cathode is immersed in and passes through said sample at a predetermined speed and has a predetermined determined area exposed to said electrolyte, an anode and a reference electrode also immersed in said sample, all three electrodes being removably positioned in the test cell in fixed relation to one another, a constant current supply and a voltage measuring means electrically connected to said electrodes;

(ii) applying a substantially constant current to the electrodes in said test cell, said current corresponding to a current density in the range of about 0.01 to 0.20 A/cm^2 based on the area of the moving cathode exposed to electrolyte in the test cell, and being sufficient to cause the exposed area of the cathode to become fully covered with deposited zinc;

(iii) moving said cathode at a predetermined speed sufficient to obtain measured values of the cathode polarization potential for zinc deposition onto zinc, under conditions such that the current density, immersed length of cathode, and the speed of the moving cathode provide a sensitivity factor having a value within the range of about 0.5 to 4.0 when calculated in accordance with the following equation:

$$\text{Sensitivity Factor} = I \times L/S$$

wherein

I represents current density, in A/cm^2;

L represents the immersed length of the moving cathode exposed to electrolyte, in cm; and

S represents the speed of the moving cathode, in cm/min;

(iv) measuring the cathode polarization potential for zinc deposition onto zinc;

(v) relating the values of the measured cathode polarization potential to the concentrations of the impurities or the polarization affecting agent or the ratio between the two in said sample; and

(vi) adjusting the concentrations of the impurities or the polarization affecting agent or the ratio between the two in the electrolyte of the process for the electrolytic recovery of zinc to obtain optimum recovery of zinc.

4,693,791

METHOD FOR PRODUCING SPINNING NOZZLE PLATES

Erwin Becker; Wolfgang Ehrfeld, both of Karlsruhe, and Peter Hagmann, Leopoldshafen, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed May 16, 1986, Ser. No. 863,987

Claims priority, application Fed. Rep. of Germany, May 17, 1985, 3517729

Int. Cl.[4] C25D *1/08*

U.S. Cl. 204—11 **6 Claims**

1. A method for producing a spinning nozzle plate having spinning nozzle channels, comprising the steps of:

(a) connecting a mold plate having mold channels that correspond to the spinning nozzle channels to a galvanic electrode having feed channels so that the mold channels communicate with the feed channels;

(b) producing negatives of the spinning nozzle channels by filling the mold channels and the feed channels with an electrically insulating molding material and subsequently removing the mold plate, leaving the negatives connected to the galvanic electrode;

(c) producing a galvanic layer which encloses the negatives of the spinning nozzle channels; and

(d) removing the negatives and the remaining molding material from the galvanic layer and galvanic electrode, respectively.

4,693,792

SYSTEM FOR ELECTROLYTICAL TREATMENT OF PRINTING CYLINDERS

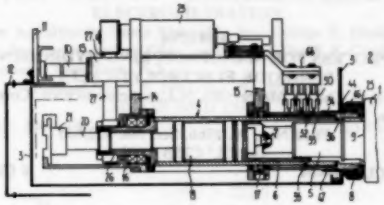
Max Dätwyler, Langenthal, Switzerland, assignor to MDC Max Dätwyler Bleienbach AG, Bleienbach, Switzerland

Filed Dec. 10, 1986, Ser. No. 940,010

Claims priority, application Switzerland, Dec. 16, 1985, 05358/85

Int. Cl.[4] C25D *5/00*

U.S. Cl. 204—25 **20 Claims**



1. In apparatus for electrolytic or galvanic treatment of printing cylinders, with an electrolyte trough, means including a rotatably mounted tail spindle for mounting and rotating each printing cylinder, and means for supplying electric currents to a contact ring supported by the tail spindle for contacting a front surface of each printing cylinder, the improvement comprising in combination:

carbon brushes for conducting said electric current in said supplying means; and

means for situating said carbon brushes between bearings of said tail spindle and said contact ring

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4,693,793

PROCESS FOR THE ELECTROCHEMICAL OXIDATION OF ALKYLPYRIDINES

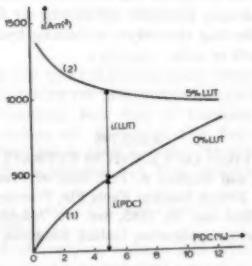
Marinus Alfenaar, Schinnen; Franciscus van den Brink, Geldrop, and Rudolf van Hardeveld, Geleen, all of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Sep. 10, 1986, Ser. No. 905,398

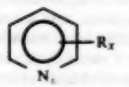
Claims priority, application Netherlands, Sep. 11, 1985, 8502485; Sep. 11, 1985, 8502486

Int. Cl.[4] C25B *3/02*

U.S. Cl. 204—78 **7 Claims**



1. Process for the electrochemical oxidation of an alkylpyridine having the formula



where R represents an alkyl group with 1–6 C atoms, and x is 1, 2 or 3, in an acid medium at a lead-containing anode of an electrolytic cell with anode and cathode compartments separated by an ion-exchange membrane, the process being characterized in that as ion-exchange membrane an anion-exchange membrane is used and as catholyte an aqueous solution of the same acid as used in the anolyte, which solution is dilute in respect of this anolyte, and subsequently the reaction product is recovered from the anolyte.

4,693,794

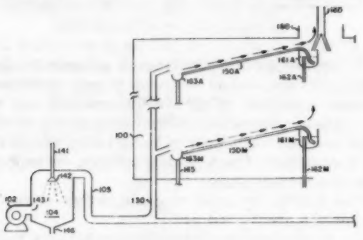
PROCESS FOR MANUFACTURING HYDROGEN PEROXIDE ELECTROLYTICALLY

John S. C. Chiang, Mercerville, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Nov. 20, 1986, Ser. No. 932,833

Int. Cl.[4] C25B *1/30*

U.S. Cl. 204—84 **6 Claims**



1. Method for operating a cell or a plurality of cells, each cell having an electrolyte inlet, an electrolyte outlet, an anode, a porous cathode permeable to a gas, and separating means defining an anode compartment and a cathode compartment, said cathode having a first surface contacting the electrolyte and a second surface forming an exterior surface of the cell, the process comprising urging air into a container enclosing the cell or plurality of cells, removing carbon dioxide from the air, urging an alkaline electrolyte into the cell or plurality of cells, directing the carbon dioxide-free air across the second surface of the cathode of the cell or plurality of cells to provide oxygen to the second surface of the cell or cells, applying an electric potential between the anode and the cathode thereby reducing oxygen to hydrogen peroxide, exhausting air from the container, and collecting electrolyte containing hydrogen peroxide from the cell or cells.

4,693,795

PRODUCTION OF URANIUM TETRAFLUORIDE

Harry Eccles, and Stephen A. Fell, both of Preston, England, assignors to British Nuclear Fuels Plc, Warrington, England

Filed Jun. 20, 1985, Ser. No. 746,656

Claims priority, application United Kingdom, Jul. 6, 1984, 8417364

Int. Cl.[4] C25B *1/24*

U.S. Cl. 204—94 **10 Claims**

1. A process for the production of uranium tetrafluoride, including the step of electrolytically reducing a solution of uranyl fluoride-sulphate in aqueous sulphuric acid to uranous fluoride-sulphate complexes, said solution having a composition such that the uranium ions remain substantially in solution throughout said step of electrolytic reduction, and the subsequent step of adding hydrofluoric acid to precipitate hydrated uranium tetrafluoride from the uranous solution.

4,693,796

METHOD FOR MANUFACTURING CATION EXCHANGE MEMBRANE

Toru Seita; Takao Satoh, and Mitsuo Kikuchi, all of Shinnanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Continuation of Ser. No. 586,892, Mar. 12, 1984, abandoned, which is a continuation of Ser. No. 316,049, Oct. 28, 1981, abandoned. This application Oct. 25, 1985, Ser. No. 792,629

Claims priority, application Japan, Nov. 5, 1980, 55-154630; Nov. 7, 1980, 55-155762

Int. Cl.[4] C25B *1/14, 1/00, 13/00*; C08D *5/20*

U.S. Cl. 204—98 **2 Claims**

1. In an electrolytic cell, the improvement consisting essentially of a cation exchange membrane means for substantially reducing alkali metal salt, said cation exchange membrane means being a cation exchange membrane prepared by providing two layers, a first layer being a film of a homogeneous blend consisting of a perfluoro carbon polymer having groups transformable into sulfonic acid groups within a range of 0.5 to 1.0 meq/g and a perfluoro carbon polymer having groups transformable into carboxylic acid groups, within a range of 0.8 to 1.5 meq/g, the blend being in a ratio by weight of 0.5 to 20, and a second layer being a film of a perfluoro carbon polymer only having groups transformable into carboxylic acid groups within a range of 0.8 to 1.5 meq/g, said films being joined together; and then transforming said groups transformable into carboxylic acid groups and said groups transformable into sulfonic acid groups respectively into carboxylic acid groups and sulfonic acid groups,

wherein said two layers are discontinuous from each other, and said first layer of said film having both the carboxylic acid and sulfonic acid groups faces the anode.

4,693,797

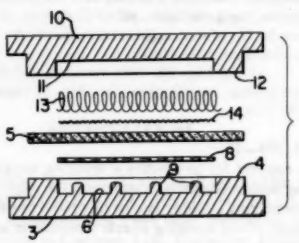
METHOD OF GENERATING HALOGEN AND ELECTROLYSIS CELL

Oronzio deNora, Milan, Italy, assignor to Oronzio deNora Impianti Elettrochimici S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 650,816, Sep. 13, 1984, which is a division of Ser. No. 539,522, Oct. 6, 1982, Pat. No. 4,530,743, which is a division of Ser. No. 382,690, May 27, 1982, Pat. No. 4,444,632, which is a division of Ser. No. 151,346, May 19, 1980, Pat. No. 4,310,452, which is a continuation-in-part of Ser. No. 102,629, Dec. 11, 1979, Pat. No. 4,343,690. This application Apr. 17, 1986, Ser. No. 853,000

Int. Cl.[4] C25B *1/24, 9/00, 11/03*

U.S. Cl. 204—128 **17 Claims**



10. A method of generating halogen comprising electrolyzing an aqueous alkali metal halide solution in the anode compartment of a cell having a housing containing at least one pair of oppositely charged electrodes separated by an ion exchange diaphragm characterized in that at least one of said electrodes comprises an electrodically charged electroconductive element, screen or plate spaced from the diaphragm by a resilient compressible mat, said mat being open to gas and electrolyte flow, resistant to the cell environment and capable when compressed of distributing pressure laterally and uniformly along

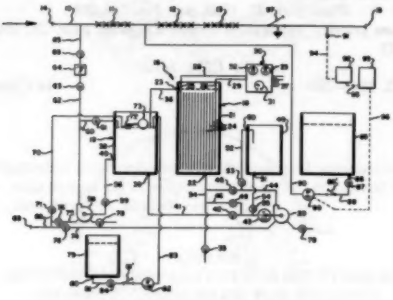
the diaphragm and an aqueous solution in the cathode compartment.

4,693,798

METHOD OF TREATING CONTAMINANT IONS IN AN AQUEOUS MEDIUM WITH ELECTROLYTICALLY GENERATED FERROUS IONS, AND APPARATUS THEREFOR

Stephen B. Gale, Williamsville, and Philip P. O'Donnell, Cheektowaga, both of N.Y., assignors to Niagara Environmental Associates, Inc., Cheektowaga, N.Y.

Filed Sep. 7, 1982, Ser. No. 415,387
Int. Cl.[4] C02F *1/46*
U.S. Cl. 204—149 11 Claims



1. Method of treating contaminant ions in a contaminated aqueous medium capable of benefitting from ferrous ions, comprising the steps of:

(a) electrolytically generating ferrous ions in a separate aqueous medium having a pH of not more than 2.8, and

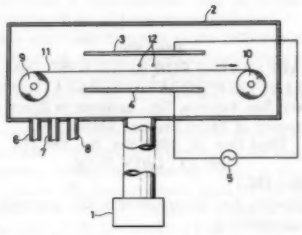
(b) introducing said separate medium containing ferrous ions into said contaminated medium at a less than 1:1 volumetric ratio of separate medium to contaminated medium.

4,693,799

PROCESS FOR PRODUCING PLASMA POLYMERIZED FILM

Kenji Yanagihara; Mituo Kimura, both of Yokohama; Masahiro Niinomi, Machida; Yasuo Nishikawa, Odawara, and Yoshito Mukaida, Kanagawa, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo and Fuji Photo Film Co., Ltd., Minamiashigara, both of, Japan

Filed Mar. 19, 1986, Ser. No. 841,183
Claims priority, application Japan, Mar. 19, 1985, 60-055549
Int. Cl.[4] C07C *3/24*; C23B *13/00*
U.S. Cl. 204—165 14 Claims



1. A process for producing a plasma polymerized film, which comprises:

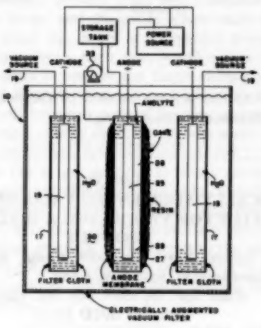
forming a plasma polymerized film on the surface of a substrate placed in a reaction zone which is not in contact with an electrode by subjecting an organic compound containing gas to plasma polymerization utilizing low temperature plasma formed by pulse discharging, in which the time of the nondischarging condition is at least 1 msec. and the voltage rise time for gas breakdown is not longer than 100 msec.

4,693,800

PROPERTY VARIATION OF DISPERSION RESINS BY ELECTROFILTRATION

Walter A. Edwards, North Ridgeville, and George R. Huddleston, Jr., Lorain, both of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Nov. 29, 1985, Ser. No. 802,930
Int. Cl.[4] B01D *13/02*
U.S. Cl. 204—180.1 23 Claims



1. Dispersed particles having replaceable ions thereon forming a surface ion environment formed by the steps comprising:

adding the dispersed particles to an electrically augmented vacuum filter having an anode cell, adding an effective amount of an anolyte compound to said anode cell so that said anode cell has a conductivity of at least 5,000 micromhos/cm, applying a current of said anode cell, and altering the surface environment of said dispersed particles by at least partially replacing ions of said dispersed particles with said anolyte compound.

4,693,801

METHOD OF DECORATING AND INHIBITING CORROSION OF METALLIC ARTICLES

Georg Bolte, Vechelde, Fed. Rep. of Germany, assignor to Schmalbach-Lubeca AG, Brunswick, Fed. Rep. of Germany

Filed Jul. 9, 1985, Ser. No. 753,317
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1984, 3425435
Int. Cl.[4] C25D *13/14*
U.S. Cl. 204—180.2 2 Claims

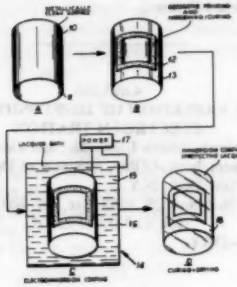
1. A method of applying a decor and protecting against corrosion, the outer curved surface of a metal can which comprises the steps of:

(a) initially printing directly on the curved outer surface of a metal can at least one decorative field of at least one color to form a decorative pattern on a metallic surface of the can;

(b) hardening the printed pattern by drying and cross-linking on said metallic surface; and

(c) thereafter completely coating the curved surface of the can and the decorative pattern imposed thereon by elec-

troimmersion lacquering and simultaneously completing a pattern to be applied to the can at least in part by a contribution to the printed pattern of the coating applied by electroimmersion lacquering.

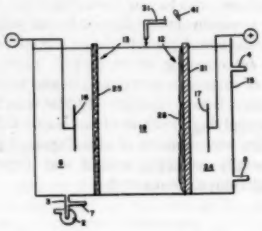


4,693,802

ELECTRICALLY AUGMENTED VACUUM FILTRATION APPARATUS FOR PRODUCING A DIALYZED CAKE PRODUCT

Joseph B. Culkin, North Stamford, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Apr. 19, 1985, Ser. No. 725,188
Int. Cl.[4] B01D *13/02*
U.S. Cl. 204—182.4 **7 Claims**



1. In a system for dewatering a suspension of particulate solids such as kaolin clay using a known electrically augmented vacuum filter apparatus comprising a tank adapted to receive a suspension to be filtered, and anodic and cathodic electrode assemblies adapted to be positioned in said tank in a manner such as to be submerged in suspension in said tank, said anodic electrode assembly being adapted for deposition thereon of filter cake and including an anode element and means for supplying anolyte into and out of said anode assembly, said cathodic electrode structure including a cathodic element associated with a filter medium adapted for the passage therethrough of filtrate,

the improvement which comprises employing a solid polymeric electrolyte on said anodic assembly which is substantially anion selective so that anions in said cake migrate relatively freely through said solid electrolyte into said anolyte while cations migrate from said cake toward said cathode thereby producing a cake which is substantially ion depleted.

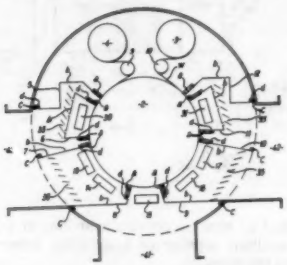
4. In a process for substantially depleting ions from a cake of solids from suspension deposited on an anode assembly, the improvement comprising using the system of claim **1**.

4,693,803

VACUUM COATING APPARATUS

Frank Casey, Rochdale, and Paul A. Downing, Bury, both of England, assignors to General Engineering Radcliffe Limited, Radcliffe, England

Filed Mar. 27, 1985, Ser. No. 716,655
Claims priority, application United Kingdom, Mar. 28, 1984, 8408023
Int. Cl.[4] C23C *14/00*
U.S. Cl. 204—298 **14 Claims**



1. A vacuum coating apparatus comprising a housing defining a vacuum chamber, partition supporting means carried within the chamber, a plurality of removable and replaceable partition means engageable with the partition supporting means for dividing the chamber into at least two sub-chambers, a process station disposed in one of the sub-chambers, and means for transporting a length of material past the process station in order to process the material, wherein the removal and replacement of at least one of the partition means permits alteration of the shape and relative positions of the sub-chambers.

4,693,804

APPARATUS FOR BIDIMENSIONAL ELECTROPHORETIC SEPARATIONS

Philip Serwer, San Antonio, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Filed Dec. 19, 1984, Ser. No. 684,275
Int. Cl.[4] G01N *27/26*
U.S. Cl. 204—182.1 **18 Claims**

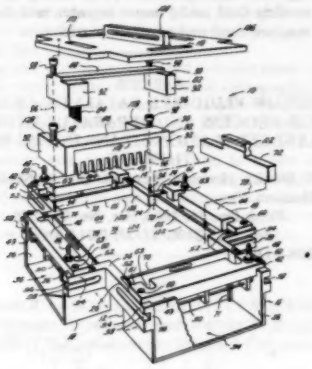
14. A process for electrophoretically separating soluble substances comprising:

forming a laterally disposed gel bed with a first gel to include a trench extending in a first direction across the gel bed;

filling a portion of the length of said trench with a second gel to define a well proximate one end of said trench;

placing the soluble substances in liquid form in said well;

electrophoretically driving said substances said first direction through said second gel; and



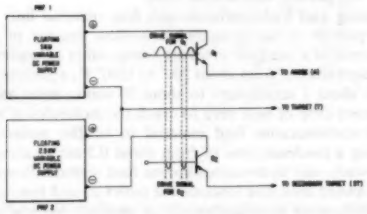
thereafter electrophoretically driving said substances from said second gel in a direction generally orthogonal to said first direction and into said first gel.

4,693,805

METHOD AND APPARATUS FOR SPUTTERING A DIELECTRIC TARGET OR FOR REACTIVE SPUTTERING

Fazle S. Quazi, Boulder, Colo., assignor to BOE Limited, San Francisco, Calif.

Filed Feb. 14, 1986, Ser. No. 829,190
Int. Cl.[4] C23C *14/34*
U.S. Cl. 204—192.22 **24 Claims**



1. A sputtering device comprising:
a chamber containing a plasma;
means for biasing said chamber to a reference potential;
a target disposed in said chamber, said target being electrically isolated from said reference potential;
an auxiliary electrode disposed in the chamber and spaced from said target, said auxiliary electrode being electrically isolated from said reference potential;
an anode disposed in the chamber and electrically isolated from said reference potential;
a first power supply electrically isolated from said reference potential and connected between said target and the anode for applying, during a sputtering cycle, a series of first waveforms to the target where each of the first waveforms place the target at a negative potential with respect to the plasma such that positive ions are drawn from the plasma to sputter the target during the occurrence of each first waveform, there being a predetermined interval of time between each of the first waveforms; and
a second power supply electrically isolated from said reference potential and connected between said target and the auxiliary electrode for applying, during a charge removal cycle, a series of second waveforms to the target, said series of second waveforms respectively occurring during the predetermined intervals between said first series of waveforms where each second waveform places the target at a positive potential with respect to the plasma such that electrons are removed from the plasma to neutralize any positive charge buildup which occurs during said sputtering cycle.

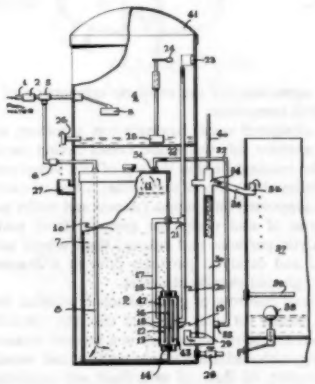
17. A sputtering method comprising the steps of:
confining a plasma within a chamber;
biasing said chamber to a reference potential;
disposing a target in said chamber and electrically isolating the target from said reference potential;
disposing an auxiliary electrode in the chamber and spacing it from the first target and electrically isolating the auxiliary electrode from said reference potential;
disposing an anode in the chamber and electrically isolating it from said reference potential;
applying, during a sputtering cycle, a series of first waveforms electrically isolated from said reference potential between the target and the anode where each of the first waveforms place the target at a negative potential with respect to the plasma such that positive ions are drawn from the plasma to sputter the target during the occurrence of each first waveform, there being a predetermined interval of time between each of the first waveforms; and
applying, during a charge removal cycle, a series of second waveforms electrically isolated from said reference potential between the target and the auxiliary electrode, said series of second waveforms respectively occurring during the predetermined intervals between said first series of waveforms where each second waveform places the target at a positive potential with respect to the plasma such that electrons are removed from the plasma to neutralize any positive charge buildup which occurs during said sputtering cycle.

4,693,806

CHLORINE GENERATOR DEVICE

Daniel M. Tucker, 1981 Chateau Ct., Walnut Creek, Calif. 94598

Filed Sep. 23, 1985, Ser. No. 778,971
Int. Cl.[4] C25B *1/26, 9/00;* B01D *21/30*
U.S. Cl. 204—252 **4 Claims**



1. A liquid sodium hypochlorite and/or chlorine generating device comprising:
a tank containing a saturated solution of sodium chloride with an electrolytic cell incorporated into the wall thereof;
said cell containing an ion selective membrane separating the

anode and cathode compartments such that the brine solution is present only in the anode compartment of said cell;

said tank submerged in a larger tank filled with water such that the cathode compartment of said cell communicates directly with the water in said larger tank;

said ion selective membrane to pass only hydrogen and sodium ions from said anode compartment to said cathode compartment thus converting the water in said larger tank to a sodium hydroxide solution;

a means of removing the hardness from incoming water by causing it to drip into the said sodium hydroxide solution in said larger tank;

said sodium hydroxide solution causing precipitation of the hardness minerals in said incoming water;

a source of direct current, the positive output thereof connected to the anode of said electrolytic cell, and the negative output thereof connected to the cathode of said electrolytic cell.

4,693,807

APPARATUS AND PROCESS FOR THE CATALYTIC CONVERSION OF A LIQUID, AS OR LIQUID AND GAS

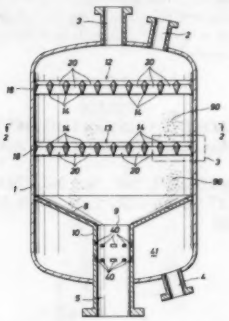
David W. B. Westerman, and Andrew M. Scott, Amsterdam, both of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 11, 1986, Ser. No. 873,029

Claims priority, application United Kingdom, Jun. 18, 1985, 8515398

Int. Cl.[4] C10G *47/24*

U.S. Cl. 208—108 **12 Claims**



1. An apparatus for the catalytic conversion of a reactant fluid which comprises:

(a) an elongated vessel having a top, a bottom, and interior and exterior side walls, said vessel having means for inlet of the reactant fluid at the top of said vessel and catalytic particles at the top of said vessel, a bed of catalytic particles supported on a support means and outlet means at the bottom of said vessel for removal from said vessel of catalytic particles and reacted fluid where said reactant fluid and catalytic particles flow in a descending path through said elongated vessel;

(b) at least one row of guide elements situated intermediate said means for inlet and said catalytic particles support means and being supported on a support means communicating with said interior side walls of said vessel to form a restriction of flow of said fluid and catalytic particles through said vessel and defining, in direction of descending flow of said reactant fluid and said catalytic particles, a narrowing part, then a narrow part and then a widening part, said guide elements having a triangular fluid feed cap with two sloping side walls interconnecting a bottom member and defining a cooling fluid conduit communicating within said triangular feed cap, wherein said bottom member of said feed cap is of sufficient length to extend beyond the terminal portion of said guide element support means and includes a multiple number of guide element cooling fluid outlet means to pass cooling fluid through said cooling fluid outlet means to enter said downflow of said reactant fluid and catalytic particles.

4,693,808

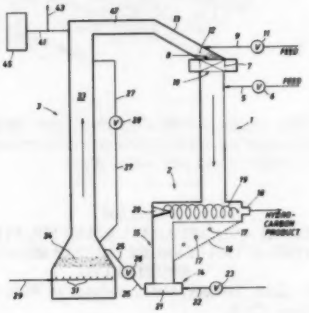
DOWNFLOW FLUIDIZED CATALYTIC CRANKING REACTOR PROCESS AND APPARATUS WITH QUICK CATALYST SEPARATION MEANS IN THE BOTTOM THEREOF

Thomas S. Dewitz, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 16, 1986, Ser. No. 874,758

Int. Cl.[4] C10G *11/18*; B01J *8/08*

U.S. Cl. 208—113 **9 Claims**



1. A process for the continuous cracking of a hydrocarbonaceous feed material to a hydrocarbonaceous product material having smaller molecules in a downflow catalytic reactor having a top portion which comprises:

(a) passing said hydrocarbonaceous feed material into the top portion of an elongated downflow reactor in the presence of a catalytic cracking composition of matter at a temperature of from about 500° to 1500° F., a pressure of from about 1 atmosphere to about 50 atmospheres and a pressure drop of near zero to crack the molecules of said hydrocarbonaceous feed material to smaller molecules during a residence time of from about 0.5 sec to about 5 sec while said hydrocarbonaceous feed material flows in downward direction towards the outlet of said reactor;

(b) withdrawing hydrocarbonaceous product material and spent catalyst having coke deposited thereon from said outlet of said reactor after said residence time;

(c) separating by passing directly, without a change in flow direction, said hydrocarbonaceous product material from said spent catalyst, into a horizontal cyclone separator in which said passage is made at a sufficient angular velocity to cause primary separation of said spent catalyst from said product material and to form a helical flow path consisting essentially of product material and entrained spent catalyst and passing said helical flow path in a path parallel to the axis of said cyclone to cause secondary separation of said entrained spent catalyst from said helical flow path and withdrawing said hydrocarbonaceous product material from the process as product material;

(d) stripping said spent catalyst separated in step(c) in contact with steam at a temperature of from about 800° F. to about 1200° F. to strip hydrocarbonaceous material from said spent catalyst;

(e) passing said stripped catalyst and an oxygen-containing gas to a riser regenerator having a bottom and a top and raising the temperature in the bottom of said riser regenerator by a temperature elevation means to arrive at a carbon burning rate temperature and maintaining, in said riser

regenerator a relatively dense fast fluidizing bed of regenerating catalyst over the near entire length of the upflow riser regenerator to produce regenerated catalyst and a spent regeneration gas vapor phase formed from the oxidation of said coke in the presence of said oxygen-containing gas; and

(f) passing said regenerated catalyst and said spent regeneration gas vapor phase to a horizontal disengaging cyclone separation means to separate said catalyst from said vapor phase by passing said catalyst and said vapor phase to said cyclone separation means at a sufficient angular velocity and passing said catalyst therefrom in a first direction consistent with the direction of passage of hydrocarbon material in step (a) to said downflow reactor and passing said vapor phase in a second direction, opposite said first direction, to secondary catalyst disengagement.

4,693,809

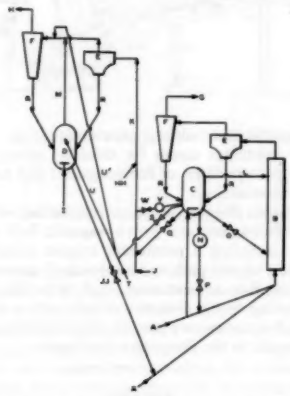
HYDROCARBON CONVERSION PROCESS

David B. Bartholic, Watchung, and Dwight F. Barger, High Bridge, both of N.J., assignors to Engelard Corporation, Edison, N.J.

Continuation-in-part of Ser. No. 804,871, Dec. 5, 1985. This application Mar. 13, 1986, Ser. No. 839,319

Int. Cl.[4] C10G *38/38;* F27B *15/14*

U.S. Cl. 208—127 **12 Claims**



1. In a hydrocarbon conversion process wherein a hydrocarbon feed is converted to lower boiling products in a reactor by contacting the same at elevated temperatures with fluid solid contact material to form said lower boiling products and spent material containing coke from said reactor is separated from reaction products and sttripped of volatile hydrocarbons in a stripping zone, vapors from the stripping zone are separated from stripped solid contact material which is regenerated with an oxygen-containing gas in a regenerator by burning off substantially all carbon therefrom and hot freshly regenerated fluid solid contact material is returned to the reactor, the improvement which comprises: carrying out both said conversion and said regeneration in a dilute phase; passing all of the solid contact material from said reactor and said regenerator through cyclone preseparators wherein rapid disengagement of solid contact material and vapors occur and wherein the solid contact material is returned to a dense bed contained in vessel other than said regenerator or reactor; passing the gaseous effluents from each of said preseparators by a vapor discharge line to the inlet of a high efficiency cyclone having an inlet in flow communication with the outlet of a preseparator for further disengagement of solids and vapors passing therein; and charging a portion of hot freshly regenerate solid contact material from the dense bed in the vessel wherein regenerated contact material is returned into the outlet of the preseparator to which solid contact material from said reactor is passed, whereby coke formation is minimized in both the vapor discharge line between the preseparator and the high efficiency cyclone associated with said reactor and in the high efficiency cyclone associated with said reactor by superheating vapors passing from said preseparator into said high efficiency cyclone.

10. A fast fluid material transport system which comprises:

A. a reactor/contactor assembly, comprising: (1) a reactor/-contactor, having an inlet end and a discharge end; (2) a preseparator, having a vapor discharge line and a solids discharge line, which is flow connected to a said discharge end of said reactor/contactor; (3) a high efficiency cyclone, having a vapor discharge line and a solids discharge line, which is flow connected by inlet means to said gas discharge line of said preseparator; and (4) a spent solids stripper, having a vent means for equalizing pressures in said preseparator and in said stripper, said solids discharge lines of said preseparator and of said cyclone being flow connected to said stripper; and

B. a regenerator/combustor assembly, comprising: (1) a regenerator/combustor, having an inlet end and a discharge end; (2) a preseparator, having a vapor discharge line and a solids discharge line, which is flow connected to said reactor/contactor; (3) a high efficiency cyclone, having a vapor discharge line and a solids discharge line, which is flow connected to said vapor discharge line of said preseparator; and (4) a surge hopper, having a vent means for equalizing pressures in said preseparator and in said surge hopper, said solids discharge lines of said preseparator and of said cyclone being flow connected to said hopper; and (5) the discharge end of said surge hopper (4) being in flow communication with the vapor discharge line (A2) of the preseparator of said reactor/-contactor assembly.

4,693,810

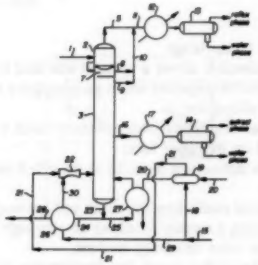
PROCESS FOR THE SEPARATION OF HYDROCARBONS FROM A MIXED FEEDSTOCK

Paulino Forte, Yonkers, and Jose A. Videira, White Plains, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 6, 1985, Ser. No. 741,830

Int. Cl.[4] C10G *7/00;* B01D *3/38*

U.S. Cl. 208—321 **1 Claim**



1. In a solvent extraction/steam distillation process for the recovery of aromatic hydrocarbons wherein stripping water is obtained from the distillation column, the improvement comprising

(a) dividing the stripping water into two streams;

(b) passing one stream to a motive steam generator wherein the stripping water is vaporized and passed to a steam ejector;

(c) passing the other stream to a heat exchanger wherein the stripping water is vaporized by lean solvent from the

distillation column, the lean solvent is cooled, and the stripping water vapor passes to the steam ejector;

(d) passing the stripping water vapor from steps (b) and (c) to the distillation column; and

(e) passing the lean solvent from step (c) to a solvent extractor.

4,693,811

SIFTER

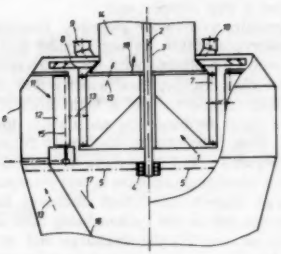
Ludger Lohnherr, Oelde-Sünninghausen, Fed. Rep. of Germany, assignor to Krupp Polysius Ag, Beckum, Fed. Rep. of Germany

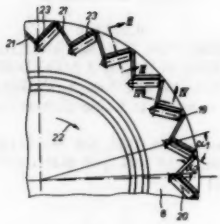
Filed Sep. 22, 1986, Ser. No. 909,869

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1985, 3539512

Int. Cl.⁴ B07B *11/06*

U.S. Cl. 209—139.2 **13 Claims**





1. In a sifter comprising:

(a) a rotor rotatable about a vertical axis and having blades circumferentially spaced about its periphery for guiding a stream of sifting air;

(b) an annular dispersing plate rotatable with the rotor and positioned on its upper face;

(c) means for delivering material to be sifted to the dispersing plate;

(d) a distributor encircling the rotor and having guide vanes for delivering a stream of sifting air through the distributor and the rotor inwardly thereof;

(e) means above the rotor for discharging the stream of sifting air and relatively fine material entrained therein; and

(f) means below the rotor and the distributor for removal of relatively coarse material,

the improvement wherein:

(g) the dispersing plate has in its peripheral zone a plurality of openings distributed substantially evenly over the periphery, the openings are arranged so as to have radially outer and inner ends;

(h) guide elements are positioned adjacent the radially outer ends of said openings, said guide elements being positioned so as to form an angle with respect to the radius of said plate and in the direction of rotation of said plate; and

(i) distributor elements are positioned between the radially outer ends of the individual guide elements and the radially inner ends of the leading guide elements in the direction of rotation, said distributor elements being positioned so as to form an angle with respect to the radius of said plate and against the direction of rotation of said plate.

4,693,812

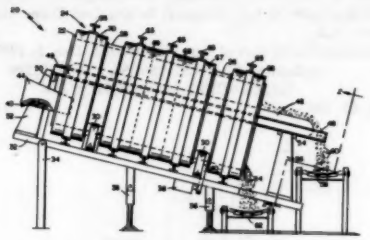
MAGNETIC DRUM SEPARATOR

Bruce E. Bond, Belmont, Mass., and William J. Harrold, Indian Mills, N.J., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 474,369, Mar. 11, 1983, abandoned. This application Jun. 6, 1985, Ser. No. 741,725

Int. Cl.⁴ B01D *25/00*

U.S. Cl. 209—224 **14 Claims**



1. A magnetic materials separator comprising:

material conductor means for directing along a predetermined path particles of ferromagnetic and nonferromagnetic materials; and

magnet means disposed in spaced relationship with said path for projecting into said path a magnetic field, said magnet means including a permanent magnet polarized in the direction of said path and sandwiched between two soft magnetic flux concentrators, each of the flux concentrators having in the direction of said path a thickness between five and twenty percent of one-half the thickness of the magnet in the direction of said path.

4,693,813

METHOD OF BROACHING OUTER PERIPHERY OF LOBE-TYPE ROTOR OF ROOTS-TYPE FLUID MACHINE, AND BROACHING CUTTER USED IN THE METHOD

Hajime Takeshita, Toyota; Takahiro Iwase, Anjyo; Naofumi Masuda, Nagoya; Takuo Sibata, Okazaki; Hiroyuki Mochizuki, Aichi; Nobuo Kobayashi, Toyota; Seiho Kawakami, Toyota, and Yosio Kuroiwa, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 30, 1986, Ser. No. 890,630

Claims priority, application Japan, Jul. 30, 1985, 60-117516; Jul. 31, 1985, 60-117547

Int. Cl.⁴ B23D *15/02*

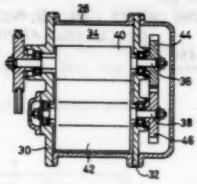
U.S. Cl. 409—244 **7 Claims**

1. A broaching method for finishing an outer peripheral surface of a resin layer of a resin-coated lobe-type rotor for a rotary fluid machine of a Roots type, comprising the steps of:

forming, with a leading preliminary cutter, at least one chip-breaker groove in the outer peripheral surface of the resin layer, such that said at least one chip-breaker groove extends in a broaching direction parallel to an axis of rotation of said rotor; and

finishing, with a trailing finish cutter, at least a portion of the outer peripheral surface of said resin layer which corresponds to a part of an entire periphery of said rotor and

which has said at least one chip-breaker groove, said finish cutter having a cutting edge contour corresponding to said part of the entire periphery of said rotor, said portion



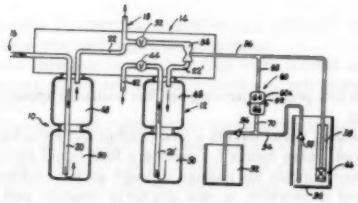
of said outer peripheral surface of said resin layer being finished by said finish cutter after said at least one chip-breaker groove is formed therein by said preliminary cutter.

4,693,814

WATER TREATMENT APPARATUS

Keith E. Brown, Solon, Ohio, assignor to Kinetico. Inc., Newbury, Ohio

Filed Sep. 4, 1984, Ser. No. 646,953
Int. Cl.[4] C02F *1/42, 9/00*; B01J *49/00*
U.S. Cl. 210—88 **18 Claims**



1. A water treatment apparatus, comprising:
(a) tank means defining a resin compartment and a filter compartment in serial fluid communication;
(b) a reservoir including means for generating a predetermined quantity of brine solution;
(c) control valve means for controlling the communication of the tank means with the reservoir, including means for drawing solution from said reservoir during a regeneration cycle and delivering it to said tank means;
(d) means for injecting a predetermined quantity of a supplemental regenerant fluid into said reservoir, for intermixing with said brine solution to produce a composite regeneration solution, said means including:
(i) a vessel containing said supplemental regenerant fluid;
(ii) conduit means communicating with said vessel and said reservoir;
(iii) automatic pump means driven by said solution drawing means and operative to extract a predetermined quantity of said supplemental regenerant fluid and to transfer it to said reservoir to be mixed with said brine solution to produce said composite regeneration solution.

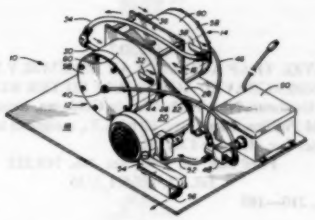
4,693,815

SELF-CLEANING FILTER SYSTEM

Henry R. Collins, Jr., 1030 W. Calhoun, Livingston, Tex. 77351

Filed Aug. 1, 1986, Ser. No. 891,601
Int. Cl.[4] B01D *35/22, 35/26*
U.S. Cl. 210—107 **8 Claims**

1. A self-cleaning filter combination, comprising:
(a) a housing having an internal cavity;
(b) a liquid agitator means rotatably mounted within said cavity and adapted to be rotated by a rotating means external of said housing;
(c) a flat filter means mounted in supported relation between said housing and a connected housing cap with a filter face openly exposed to said cavity;
(d) said housing having inlet and outlet liquid flow passages for circulating a liquid sample through said cavity around said agitator and into filterable contact with said filter face;
(e) said agitator means having means to agitate said liquid sample within said cavity and to pump a portion of said



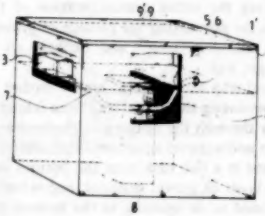
liquid sample in a flow washing action against and across said filter face said agitator means comprises an agitator rotor having an irregular circumferential surface for agitating said liquid sample and also having a plurality of passageways inclined with respect to the axis of said rotor and disposed different radial distances away form said axis to cause a pumping action responsive to rotation of said rotor, said pumping action liquid sample in a flow washing action against and across said filter face; and
(f) said housing cap having a liquid filtrate passageway for withdrawing a filtered sample of said liquid sample through said filter means.

4,693,816

BIOLOGICAL FILTER HEATING ARRANGEMENT FOR TREATMENT OF WASTE WATER

Arto Salokangas, Lahti, Finland, assignor to Oy Ekofinn Ab, Finland

Filed Feb. 24, 1986, Ser. No. 832,585
Claims priority, application Finland, Feb. 22, 1985, 850738
Int. Cl.[4] C02F *3/06*
U.S. Cl. 210—150 **5 Claims**



1. A heating arrangement for outdoor air introduced into a biological filter intended for the treatment of waste waters, said biological filter comprising:
intake openings for the outdoor air;
a heat exchanger means mounted within the filter and connected to the intake openings for heating the outdoor air;
a blower connected to the heat exchanger means for blowing the heated air through a layer of filter material contained within the filter; and
exhaust openings for the air,
wherein said heat exchanger means includes a heat ex-

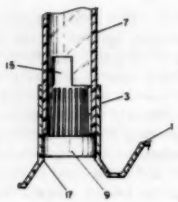
changer installed between the intake openings and the blower, the warmer side of said heat exchanger being in direct contact with the waste water flowing in the filter, whereby the outdoor air within the heat exchanger is heated directly by heat transferred thereto from the waste water.

4,693,817

GRAVEL TRAP AND COLLAR ASSEMBLY FOR AN UNDERGRAVEL AQUARIUM FILTER SYSTEM

Jerome Goldman, New York; Marvin Goldman, Great Neck, and Gerald Phillips, Glen Cove, all of N.Y., assignors to Penn Plax Plastics Inc., Garden City, N.Y.

Filed Jun. 10, 1985, Ser. No. 743,332
Int. Cl.⁴ E04H *3/16*
U.S. Cl. 210—169 **16 Claims**



1. A gravel trap and collar assembly for an undergravel aquarium filter which comprises;

a collar, projecting from the top surface of a bottom plate of the undergravel filter, the collar being positioned over means defining an opening in the bottom plate which forms means defining a passageway through the bottom plate into a bottom cavity under the bottom plate;

a gravel trap, removeably fitted into the collar, the gravel trap having a base ring, fitting within the collar so that an interior wall surface of the collar and the outer surface of the base ring are substantially adjacent to each other, the gravel trap further having, attached to the base ring, and covering the entire central portion of the base ring, a means for preventing the passage of gravel therethrough, while allowing water and bubbles air to pass therethrough; and

the gravel trap and collar assembly further having a means for preventing the gravel trap from falling into the bottom cavity through the opening in the bottom plate.

16. In an undergravel aquarium filter wherein a bottom plate is positioned in a fish tank over the bottom surface, and covered by a layer of gravel material, and wherein uptake tubes are positioned in an opening in the bottom plate so that the opening forms a passageway between the uptake tubes and a bottom cavity under the bottom plate, the improvement comprising;

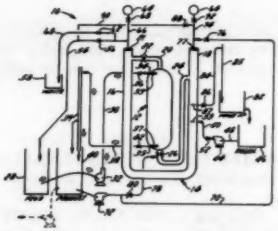
the undergravel filter being provided with a collar, projecting from the bottom plate, in an upward direction, and positioned directly over the opening in the bottom plate, and a gravel trap, removeably fitted into the collar, the gravel trap having a base ring, the outer surface of which is substantially adjacent to an inner wall surface of the collar, and a means for preventing the entry of the gravel material into and through the central portion of the base ring.

4,693,818

ION EXCHANGE APPARATUS

Conrad Terrien, Elmhurst, and Lee G. Carlson, Willow Springs, both of Ill., assignors to UIP Engineered Products Corporation, Addison, Ill.

Filed Oct. 22, 1984, Ser. No. 663,184
Int. Cl.⁴ B01J *47/10*
U.S. Cl. 210—189 **15 Claims**



1. A low pressure moving bed ion exchange apparatus comprising

a loading vessel having a feed conduit and a discharge conduit, pump means for passing a feed liquid through said feed conduit for passage through an ion exchange resin bed therewithin to said discharge conduit, said loading vessel having a resin inlet and a resin outlet,

a regeneration vessel having an ion exchange resin bed therewithin and being in resin passing communication with said resin inlet of the loading vessel through a first resin transfer means connected to one end of said regeneration vessel and in resin passing communication with said resin outlet of the loading vessel through a second resin transfer means connected to the other end of said regeneration vessel,

a first resin valve in said first resin transfer means to control the flow of resin from said one end of said regeneration vessel to said resin inlet in said loading vessel,

a second resin valve in said second transfer means to control the flow of resin from said resin outlet in said loading vessel to the other end of said one end of said regeneration vessel,

first means for passing a regenerant solution into said regeneration vessel,

second means for passing a displacement rinse liquid into said resin bed in said regeneration vessel to displace said regenerant solution,

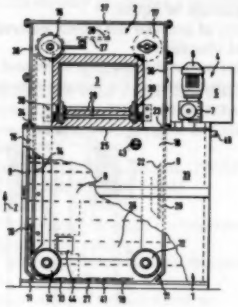
first pressure means connected to said one end of said regeneration vessel for transferring a predetermined volume of said resin bed in said one end of said regeneration vessel through said first transfer means into said loading vessel, and

second pressure means connected to said other end of said regeneration vessel for shifting the resin bed in said regeneration vessel from said other end of said regeneration vessel to replace the volume of resin transferred from said one end of said regeneration vessel on transfer to said loading vessel.

4,693,819
TREATMENT OF EMULSIONS AND INDUSTRIAL WASTE WATERS

Ralf F. Piepho, Wennigsen, Fed. Rep. of Germany, assignor to Ralf F. Piepho Abwassertechnik GmbH, Wennigsen, Fed. Rep. of Germany

Filed Dec. 8, 1986, Ser. No. 939,171
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1986, 3600935
Int. Cl.[4] B01D *21/08*
U.S. Cl. 210—202 **20 Claims**



1. Apparatus for treating emulsions and industrial waste water and the like, said apparatus comprising:

a reaction container in which a fluid to be treated and a separating agent are mixed whereby a precipitate is formed;

a box-shaped settling container having a smooth bottom and a pair of spaced inner and outer sidewalls spaced apart from each other to define channels, said precipitate settling to the smooth bottom of said settling container;

discharge means for discharging said precipitate from said settling container, said discharge means including an endless honeycomb band of a defined cross sectional shape and drive means for driving said honeycomb band over said smooth bottom and through said sidewall channels for carrying said precipitate out of said settling container;

an opening from said settling container through which said endless band carrying said precipitate passes out of said settling container, said opening substantially corresponding in shape to the cross-sectional shape of said endless band;

storage means for storing said precipitate; and

guide means for directing said endless band over said storage means, whereby the precipitate is discharged to said storage means from said endless band.

4,693,820
MODULAR WATER CONDITIONING APPARATUS

Raymond D. Baxter, 6118 Via Nitos, Yorba Linda, Calif. 92686

Filed Jul. 1, 1985, Ser. No. 750,467
Int. Cl.[4] B01D *27/08*
U.S. Cl. 210—232 **24 Claims**

1. A filter assembly for fluids comprising:

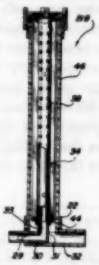
(a) an elongated hollow cylindrical casing having an open upper end,

(b) a hollow cylindrical base sealed at its lower end by a generally flat base plate and sealingly joined at its upper end to the lower end of said casing, said hollow cylindrical base being coaxial with said hollow cylindrical casing, and said hollow interior of said casing communicating with the hollow interior of said base,

(c) a hollow cylindrical boss positioned coaxially and concentrically on the upper inner surface of said base plate of said base, within the hollow interior of said base, said boss having an open upper end,

(d) a hollow outlet tube communicating with the interior of said boss, said hollow outlet tube extending radially outwards from said boss beyond the cylindrical wall of said hollow cylindrical base,

(e) a hollow inlet tube communicating with the generally annular shaped hollow interior region of said base between its interior walls and the outer surfaces of said boss and said outlet tube, said outlet tube being coaxial with



said inlet tube and extending radially outwards from the cylindrical wall of said hollow cylindrical base in a direction diametrically opposed to the extension direction of said inlet tube,

(f) an elongated hollow cylindrical filter element holder having an axial passageway adapted to couple sealingly to the hollow interior of said boss,

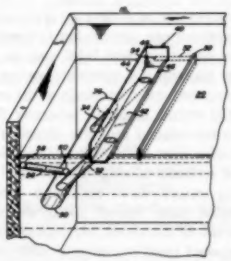
(g) means for sealingly connecting said passageway in said filter element holder to said interior of said boss, and

(h) means for sealing said open upper end of said elongated hollow cylindrical casing.

4,693,821
WEIR FOR WASTE WATER TREATMENT SYSTEMS

Mervyn C. Goronszy, Cremorne, and Raul Olavarria, Seven Hills, both of Australia, assignors to Transfield, Inc., Irvine, Calif.

Filed Sep. 23, 1985, Ser. No. 779,116
Int. Cl.[4] B01D *36/04*
U.S. Cl. 210—241 **2 Claims**



1. A weir system for decanting the upper layers of wastewater from a wastewater tank to selectively lower the water level in the tank, comprising, in combination:

(a) a rotatably mounted header pipe extending horizontally across the wastewater tank adjacent an end of the wastewater tank below the water level in the tank for withdrawing wastewater from the tank, said pipe forming a plurality of openings through the wall thereof;

(b) an elongate weir extending horizontally across the wastewater tank, the weir comprising a bottom forming a plu-

rality of outlet openings therethrough, a trailing side proximate said end of the tank forming an upper trailing edge, a leading side distal of said end of the tank forming a leading edge proximate the body of wastewater in the tank, and ends closing the weir, said bottom, sides and ends defining a trough-like weir structure;

(c) a plurality of downcomer pipes extending between the weir and the header pipe and connected to said plurality of outlet openings therein providing closed fluid communication between the weir and the header pipe through said plurality of outlet openings therein, for permitting flow into the header pipe only from the weir; and

(d) positive drive means associated with the tank for selectively rotating the header pipe thereby moving the weir in an arcuate path, respectively downwardly to lower the level of wastewater in the tank and upwardly to permit the tank to fill with wastewater, the weir being so constructed and disposed that the leading edge thereof is always lower than the trailing edge thereof thus permitting wastewater to flow into the weir only over the leading edge thereof.

4,693,822

FLUIDIC CONTACTORS

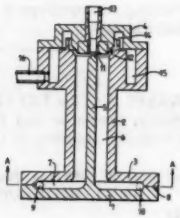
Michael J. Bowe, Newton-with-Scales; Samuel N. Oruh, Lytham St. Annes, and Jaswant Singh, Forton, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Feb. 20, 1985, Ser. No. 703,355

Claims priority, application United Kingdom, Feb. 23, 1984, 8404749

Int. Cl.[4] B01D *17/00*

U.S. Cl. 210—255 **7 Claims**



1. A fluidic contactor including a vortex stage and a separator stage, the vortex stage comprising a closed vortex chamber having at least one tangential inlet and an axial outlet, the separator stage including a column forming an extension of said outlet and spaced apart openings at the end of the column remote from the vortex chamber whereby fluids of different densities when introduced into the chamber through said at least one tangential inlet are caused to swirl through the chamber to achieve intimate mixing thereof and substantially the entire resulting mixed flow emerging from the chamber through the axial outlet spirals along the column to cause density separation of the fluids, the separated fluids emerging through said spaced apart openings at said end of the column.

4,693,823

LIQUID FILTER

Robert W. Matchett, Dover, N.H., assignor to Fibredyne, Inc., Dover, N.H.

Filed Jun. 26, 1986, Ser. No. 879,061

Int. Cl.[4] B01D *25/06*

U.S. Cl. 210—266 **31 Claims**

1. A liquid filter cartridge comprising:

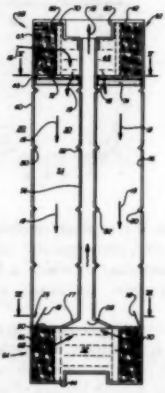
(a) a hollow cylindrical body having first and second bulkheads closing first and second ends, respectively, thereof, said body having input means for introducing a liquid to be filtered into said body adjacent said first end;

(b) a first intermediate bulkhead disposed in spaced relationship with said first bulkhead to form a first chamber therebetween, said first intermediate bulkhead having a passageway therethrough for the passage of liquid;

(c) a second intermediate bulkhead disposed in spaced relationship with said second bulkhead to form a second chamber therebetween, said first and second intermediate bulkheads being spaced from one another to form a third chamber therebetween within said body, said second intermediate bulkhead having a passageway therethrough for the passage of liquid;

(d) a quantity of granular adsorbent material disposed within said third chamber;

(e) first filter means disposed between said input means and said granular material for initially filtering liquid coming



into said body and for preventing backflow of said granular material out of said third chamber into said input means;

(f) an outlet conduit axially disposed within said body communicating with said second chamber through said second intermediate bulkhead on one end, the other end of said outlet conduit passing through said first intermediate bulkhead and said first bulkhead being the outlet for filtered liquid from the filter cartridge;

(g) second filter means disposed between said passageway of said second intermediate bulkhead and said point of communication of said outlet conduit therethrough on said one end for preventing outflow of said granular material from said third chamber into said outlet conduit; and

(h) said body includes means within said third chamber for preventing laminar flow of liquid therethrough adjacent said body and for forcing the liquid to flow through the granular material.

4,693,824

PROCESS FOR THE PRODUCTION OF POLYBENZIMIDAZOLE ULTRAFILTRATION MEMBRANES

Michael J. Sansone, Berkeley Heights, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Sep. 23, 1985, Ser. No. 778,994

Int. Cl.[4] C08J *9/28*

U.S. Cl. 210—500.28 **16 Claims**

1. A process for the production of a semipermeable polybenzimidazole membrane comprising:

(a) forming a solvent solution of a polybenzimidazole polymer;

(b) depositing a film of said solution upon a support;

(c) evaporating at least a part of said solvent from said film to form a solid layer on the exposed surface of said film; and

(d) coagulating said film in a coagulation bath comprised of a solvent, selected from the group consisting of an acid, present at the 0.5 to 5 percent by weight level, N,N-dimethylacetamide, N,N-dimethylformamide, dimethyl sulfoxide and N-methyl-2-pyrrolidone, present in the range of about 5 to about 85 percent by weight based on the total weight of the coagulation bath, and a non-solvent for said polymer present in the range of about 99.5 to about a 15 percent by weight based on the total weight of the coagulation bath and thereby producing a semipermeable membrane.

4,693,825

METHOD FOR THE PREPARATION OF POLYBENZIMIDAZOLE MEMBRANES

Norman S. Trouw, Gillette, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Sep. 23, 1985, Ser. No. 779,017
Int. Cl.[4] C08J 9/28
U.S. Cl. 210—500.28 **17 Claims**

1. A process for the preparation of a semipermeable polybenzimidazole membrane comprising:

(a) forming a solvent solution of a polybenzimidazole polymer;

(b) adding benzyl alcohol to said solution;

(c) depositing a film of polybenzimidazole upon a support;

(d) removing sufficient solvent from said film to form a solid layer on the exposed surface of said film; and

(e) coagulating said film with a coagulating non-solvent for said polymer to remove residual solvent and thereby to produce a semipermeable membrane.

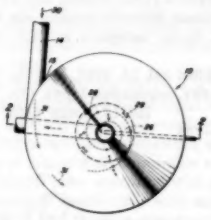
15. The semipermeable membrane produced in accordance with the process of claim 1.

4,693,826

OVERFLOW FOR SLURRY TANK

Jeffrey L. Beck, Morgantown, W. Va., and David W. Campbell, Bethel Park, Pa., assignors to Conoco Inc., Ponca City, Okla.

Filed Feb. 18, 1986, Ser. No. 830,037
Int. Cl.[4] E01D 45/12
U.S. Cl. 210—512.1 **4 Claims**



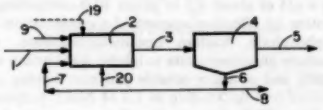
1. A tank comprising: means for confining slurry which is comprised of fluid and particles of various sizes, said tank having a cylindrical side wall having a substantially vertical axis and an upper and lower edge, a bottom attached to said side wall at its lower edge along its periphery and an inlet tangentially mounted into said side wall between said lower and said upper edge of said cylindrical side wall; an outlet for said tank including, means enabling slurry entering tangentially into said tank to have a rotational force generated around the axis of said tank so that slurry moving toward said outlet pipe between an inner cone and said pressure confining top will have its velocity gradually increased causing particles to be deflected toward said cylindrical side wall and toward the bottom of said tank. Consisting essentially of a pressure confining top attached to said upper edge, an outlet pipe mounted near the center of said top and said inner cone, means for mounting said inner cone coaxial with said pressure confining top, said inner cone having a base diameter less than the diameter of said pressure confining top.

4,693,827

PROCESS FOR PROTECTION OF BIOLOGICAL NITRIFICATION SYSTEMS

Carol J. Mordorski, Minneapolis, Minn., assignor to Zimpro Inc., Rothschild, Wis.

Filed Mar. 20, 1986, Ser. No. 841,636
Int. Cl.[4] C02F 3/30, 3/08
U.S. Cl. 210—614 **7 Claims**



1. In a process for biotreating wastewater to remove carbonaceous materials and soluble ammonia therefrom to produce a biotreated wastewater, wherein said wastewater is contacted with an oxygen-containing gas and a biomass containing heterotrophic carbon-consuming organisms to oxidize carbonaceous materials and nitrifying organisms to oxidize ammonia to nitrite and nitrate, said process being subject to deterioration in degree of nitrification resulting from fluctuations in pH, temperature or dissolved oxygen, or the presence of toxic materials, including soluble ammonia in said wastewater, wherein the improvement is a method to deter said deterioration and to enhance recovery of nitrification, comprising the steps of:

(a) establishing a predetermined degree of nitrification representing an acceptable level of soluble ammonia in said biotreated wastewater;

(b) determining the concentration of soluble ammonia in said biotreated wastewater;

(c) when the determined concentration of soluble ammonia in said biotreated wastewater is greater than said acceptable level, introducing into said wastewater in said process, or into a prior carbonaceous material removal step, a rapidly-metabolized soluble or miscible organic material containing less than 5 percent nitrogen wherein the ratio of said organic material to the ammonia concentration in excess of said acceptable level in the biotreated wastewater is 10–400, to generate additional heterotrophic organisms which incorporate therein ammonia from said wastewater to reduce the ammonia concentration in said wastewater to an acceptable level and prevent toxic or inhibitory elevated levels of ammonia from forming in said process.

4,693,828

METHOD OF ION-EXCHANGING AND/OR ADSORPTION

Toshio Yoshioka, Otsu; Seiichi Yoshikawa, Koga, and Masaharu Shimamura, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

PCT No. PCT/JP84/00431, § 371 Date May 7, 1986, § 102(e) Date May 7, 1986, PCT Pub. No. WO86/01744, PCT Pub. Date Mar. 27, 1986
PCT Filed Sep. 10, 1084, Ser. No. 866,489
Int. Cl.[4] C02F 1/42
U.S. Cl. 210—679 **18 Claims**

1. A method of producing superpure water with an ion-exchanger, characterized in that the water is treated with a resin component containing an ion exchange resin selected from the group consisting of cation- and anion-exchange resins and mixtures thereof having an average particle diameter of 100 to 1000μ, and thereafter the water is treated with an ion-exchange

fiber component containing an ion-exchange fiber selected from the group consisting of a cation-exchange fiber, an anion-exchange fiber and a chelate fiber and mixtures thereof.

4,693,829

USE OF CARBOXYLIC ACID/SULFONIC ACID COPOLYMERS AS ALUMINUM ION STABILIZERS

Bennett P. Boffardi, Bethel Park, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Apr. 3, 1986, Ser. No. 847,995
Int. Cl.[4] C02F *5/12*
U.S. Cl. 210—697 **2 Claims**

1. A method for inhibiting barium sulfate scale deposition in a recirculating water system containing aluminum ions and having a pH of about 4.5 to about 10.0 comprising adding to said system an effective amount of a composition comprising tripolyphosphate, sodium hexametaphosphate, polyacrylic acid, sodium glucoheptanate to inhibit said barium sulfate scale deposition and a water soluble polymer having an intrinsic viscosity of 0.05 to 0.5 dl/g in 1.0 M NaCl, prepared from:

(A) 50 to 70%, by weight, of an unsaturated carboxylic compound selected from the group consisting of acrylic acid, methacrylic acid, their salts and mixtures thereof; and

(B) 30 to 50%, by weight, of an unsaturated sulfonic compound selected from the group consisting of 2-acrylamido-2-methylpropyl sulfonic acid, 2-methacrylamido-2-methylpropyl sulfonic acid, their salts and mixtures thereof in an amount effective for solubilizing said aluminum ions and allowing said composition to effectively inhibit said barium sulfate scale deposition.

4,693,830

FLOCCULANTS FOR BRINE-CONTAINING SYSTEMS

David C. Thornton, Midland, and Mark J. McKinley, Kawkawlin, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 688,775, Jan. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 479,297, Mar. 28, 1983, abandoned. This application Sep. 23, 1985, Ser. No. 779,345
Int. Cl.[4] C02F *1/56*
U.S. Cl. 210—734 **8 Claims**

1. An improved method for flocculating suspended particulate solids from a brine containing suspension of potash ore wherein said method comprises the steps of contacting the brine with a flocculating amount of a water-soluble anionic polymer comprising, in polymerized form, from about 85 to 94 weight percent of a non-ionic, water-soluble, ethylenically unsaturated acrylamide monomer and from 5 to about 10 weight percent of a water-soluble, ethylenically unsaturated monomer containing carboxyl groups or a water-soluble, ethylenically unsaturated monomer containing groups which have been converted, during or subsequent to polymerization to carboxyl groups selected from the group consisting of acrylic acid, methacrylic acid, and alkali metal salts thereof, and from about 1 to about 5 weight percent of a N-sulfoalkylamide selected from the group consisting of 2-acrylamido-2-methylpropane sulfonic acid, 2-acrylamide propane sulfonic acid, 2-acrylamide sulfonic acid, and alkali metal salts thereof; flocculating the suspended particulate solids; and settling the flocculated particulate solids from the brine.

4,693,831

RISE-RATE CONTROL OF PULSED-BED GRANULAR MEDIUM FILTERS

Gary A. Garzonetti, Chicago, Ill., assignor to Zimpro Inc., Rothschild, Wis.

Filed Jan. 28, 1987, Ser. No. 8,020
Int. Cl.[4] B01D *37/00*
U.S. Cl. 210—744 **20 Claims**

1. A method for removing solids from an influent liquid during a filtration time in a filtration cycle by passage through a down-flow granular medium filter bed in a filter tank, said filter bed having an upper surface and a lower surface and adapted for periodic backwashing and upwardly directed sub-fluidizing pulses of fluid from an array of orifices at times other than during backwash, comprising:

(a) continuously introducing said influent liquid into said filter tank for downward solids-removing passage through said filter bed;

(b) monitoring influent liquid level above said filter bed in said filter tank;

(c) determining a rise rate of said influent liquid level;

(d) activating a pulse system comprising upwardly-directed multiple sub-fluidizing pulses of a fluid through said filter bed from said array of orifices, each said pulse initated whenever said rise rate attains a predetermined value, to dislodge solids from said upper surface of said bed, store filtered solids at loci within said bed, and reduce said rise rate to extend said filtration time between backwashes; and

(e) backwashing said filter bed at an upward fluidizing velocity after completion of two or more said pulses.

4,693,832

PREPARATION OF SAFE DRINKING WATER

Marilyn M. Hurst, Hudson, Ohio, assignor to Quantum Technologies, Inc., Twinsburg, Ohio

Filed Nov. 27, 1985, Ser. No. 802,266
Int. Cl.[4] C02F *1/76*
U.S. Cl. 210—756 **12 Claims**

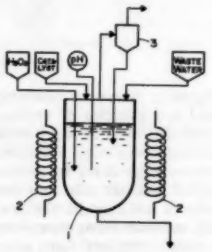
1. A disinfection process for preparing a potable water supply having a more stable and longer lasting residual germicidal activity for preserving its integrity and safety during distribution to the user comprising mixing into semi-finished water, produced by chemical pretreatment steps including primary disinfection but which lacks a significant free available chlorine residual, an aqueous solution containing between about 0.1 and about 10 grams per liter of HOCl and having a pH between about 3 and about 6 in proportions imparting a free available chlorine residual in the resultant water supply of at least about 1.0 ppm as determined about 30 to 60 minutes after said mixing.

4,693,833

METHOD OF TREATING RADIOACTIVE WASTE WATER RESULTING FROM DECONTAMINATION

Masami Toshikuni; Kazunori Suzuki, and Norie Yoshida, all of Kanagawa, Japan, assignors to JGC Corporation, Tokyo, Japan

Filed Jul. 24, 1985, Ser. No. 758,232
Claims priority, application Japan, Oct. 26, 1984, 59-226052
Int. Cl.[4] C02F *1/58*
U.S. Cl. 210—759 **3 Claims**



1. A method of treating readioactive waste water containing organic material resulting from decontamination, comprising decomposing said organic material by oxidation using hydrogen peroxide at a temperaure of 60°–90° C. in the presence of

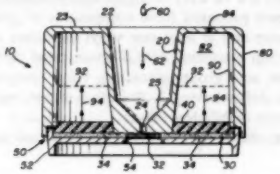
copper ions and iron ions as catalysts, said organic material consisting essentially of at least one organic acid, one organic inhibitor, and one surface active agent.

4,693,834

TRANSVERSE FLOW DIAGNOSTIC KIT

Miles G. Hossom, Duluth, Ga., assignor to Murex Corporation, Norcross, Ga.

Filed May 5, 1986, Ser. No. 857,914
Int. Cl.[4] B01D *29/04*
U.S. Cl. 210—767 **26 Claims**



1. In a device for testing for the presence of an analyte in a liquid and having an elongated liquid input means with a receiving inlet and a discharge aperture, said receiving inlet being larger than said discharge aperture, a filter means positioned below said liquid input means and having a viewable reaction zone and at least one peripheral zone associated with said reaction zone, absorbent means associated with only said peripheral zone to draw liquid from said reaction zone to said peripheral zone and retainer means for holding such filter means in position below said liquid input means such that said reaction zone receives liquid funneled from said receiving inlet to said discharge aperture, the improvement comprising:

a. a body portion having an opening in both the top and bottom thereof, said retaining means cooperating with said bottom opening to hold said filter means in said body portion below said liquid input means and to hold said absorbent means in association with only said peripheral zone of said filter, and

b. a cap for removable attachment to said top opening of said cylindrical body portion, said cap having said elongated liquid input means projecting therefrom such that when said cap is attached to said body portion, said liquid input means discharge aperture is in contact with said filter means reaction zone for enabling liquid poured into said receiving inlet to be funneled for localized discharge only on said reaction zone.

14. In a method for testing for the presence of an analyte in a liquid by providing an elongated liquid input means with a receiving inlet and a discharge inlet, said receiving inlet being larger than said discharge aperture, positioning a filter means below said liquid input means with a viewable reaction zone and at least one peripheral zone associated with said reaction zone, associating absorbent means only with said peripheral zone to draw liquid from said reaction zone to said peripheral zone and holding said filter means in position below said liquid means with a retainer means such that said reaction zone receives liquid funneled from said receiving inlet to said discharge aperture, the improvement comprising the steps of:

a. providing a body portion having an opening in both the top and bottom thereof, said retainer means cooperating with said bottom opening to hold said filter means in said body portion below said liquid input means and to hold said absorbent means in association with only said peripheral zone, and

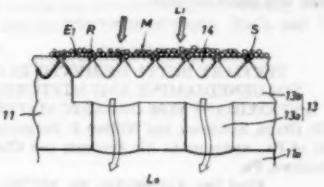
b. removably attaching a cap to said top opening of said cylindrical body portion, said cap having said elongated liquid input means projecting therefrom such that when said cap is attached to said body portion, said liquid means discharge aperture is in contact with said filter means reaction zone for enabling liquid poured into said inlet to be funneled for localized discharge only on said reaction zone.

4,693,835

FILTER PROCESS AND ITS DEVICE

Koichi Arai, Kanagawa, Japan, assignor to Arai Machinery Corporation, Japan

Continuation of Ser. No. 638,660, Aug. 7, 1984, abandoned. This application Aug. 21, 1985, Ser. No. 767,746
Int. Cl.[4] B01D *29/48*
U.S. Cl. 210—777 **2 Claims**



1. A filter process comprising:

forming a screw thread portion about an outer circumference of a cylinder, said cylinder having a plurality of passages longitudinally-formed about said cylinder and communication with an internal cavity in said cylinder;

wrapping an isosceles triangularly-shaped wire about said screw thread portion thereby forming an essentially flat surface comprises of base surfaces of said wire, said triangularly-shaped wire having excised corner portion on said base surface thereby forming a recess to a slit formed between adjacent wires coinciding with said longitudinally-formed passages, said slit being of a width less than a width of said recess leading to said slit;

coating a filter medium of fine particles on said wire in and about said recess to thereby form a layer of filter medium; and

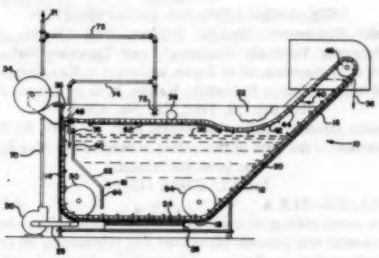
carrying out a filter operation by passing a liquid through said layer of filter medium and thence through said slit from said recess of said wire.

4,693,836

FILTER APPARATUS WITH BYPASS PREVENTION

David H. Willson, Farmington Hills, Mich., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Apr. 28, 1986, Ser. No. 856,406
Int. Cl.[4] B01D *29/02, 33/38*
U.S. Cl. 210—791 **9 Claims**



5. A method of filtering comprising

providing a filter tank with unfiltered liquid,

having an oulet chamber at the bottom of said filter tank,

indexing a filter media along said outlet chamber such that

such unfiltered liquid must pass through said filter media to exit said filter tank and enter said outlet chamber as filtered liquid,

providing a baffle plate within said filter tank near a rear wall of said filter tank, said baffle plate extending from above the level of the unfiltered liquid in said filter tank to near the filter media along the bottom of the filter tank and in contact with each side wall of the filter tank,

and providing a spray of filtered liquid between the rear wall of said filter tank and said baffle such that a stream of filtered liquid passes beneath said baffle into said filter tank so as to inhibit unfiltered liquid from passing beneath said baffle from said filter tank and around said filter media into said outlet chamber.

4,693,837

TERTIARY BUTYL DERIVATIVES OF TOLUENEDIAMINE AND MIXTURES AS ANTIOXIDANT FOR ORGANIC MATERIALS

Dale D. Dixon, Kutztown, and William F. Burgoyne, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 4, 1986, Ser. No. 937,769
Int. Cl.[4] C10M *133/12*
U.S. Cl. 252—50 **6 Claims**

1. In an organic material normally susceptible to gradual degradation in the presence of oxygen during use over an extended period of time and of the type in which an aromatic diamine has been added as an antioxidant, the improvement which comprises utilizing 5-tert-butyl-2,4-toluenediamine as said aromatic diamine.

4,693,838

MULTIFUNCTIONAL VISCOSITY INDEX IMPROVER

Vijaya K. Varma, Belle Mead; Esther D. Winans, Colonia; Rosemary O'Halloran, Union, all of N.J., and Phillip W. Brewster, Camlachie, Canada, assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Oct. 29, 1985, Ser. No. 792,538
Int. Cl.[4] C10M *145/10*
U.S. Cl. 252—51.5 R **44 Claims**

1. A process comprising solution grafting a normally solid hydrocarbon polymer of C_2 to C_{28} olefin, said polymer having a number average molecular weight in the range of about 5,000 to 500,000 with an unsaturated material selected from the group consisting of: (A) ethylenically unsaturated C_3 to C_{10} carboxylic acid having 1 to 2 carboxylic acid groups or an anhydride group, and (B) nitrogen-containing ethylenically unsaturated monomers containing 6 to 30 carbon atoms and 1 to 4 nitrogen atoms, in a synthetic hydrocarbon oil having a number average molecular weight of about 200 to 10,000.

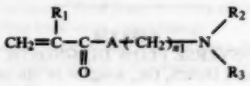
4,693,839

METAL ROLLING OIL COMPOSITION

Hiroshi Kuwamoto; Shuichi Iwadoo; Yuji Okami, all of Fukuyama; Hiroyuki Nagamori, and Yasuhiro Nakagawa, both of Wakayama, all of Japan, assignors to Kao Corporation and Nippon Kokan Kabushiki Kaisha, both of Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 430,377
Claims priority, application Japan, Dec. 18, 1981, 56-204623
The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.
Int. Cl.[4] C10M *145/14*
U.S. Cl. 252—51.5 A **4 Claims**

1. A metal rolling oil composition characterized by comprising essential components (a) at least one lubricating oil component selected from the group consisting of animal and plant oils, mineral oils and aliphatic acid esters, and (b) at least one water-soluble cationic or amphoteric polymer compound having at least one basic nitrogen atom or cationic nitrogen atom in one recurring unit and having an average molecular weight ranging from 1000–1,000,000, being further characterized as selected from the group consisting of homopolymers of nitrogen-containing monomers represented by general formula (I)



A is —O— or —NH—,

n_1 is an integer 1–3,

R_1 is H or CH_3,

R_2 and R_3 are H, CH_3 or C_2H_5, independently,

copolymers prepared from compounds of general formula (I) above and at least one vinyl monomer selected from the group consisting of α,β-unsaturated carboxylic acids, sulfonic acid group-containing vinyl compounds and aliphatic olefins having 2–20 carbon atoms, and ring-opened polymers of ethyleneimine;

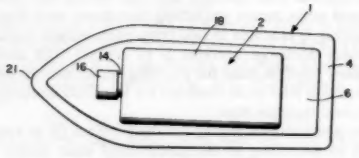
said components (a) and (b) being dispersed in water form.

4,693,840

NO RINSE LIQUID CAR CLEANER WITH SOLID POLYMERS

Toan Trinh, Maineville, Ohio, and John S. Scheper, Gainesville, Fla., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 642,704, Aug. 20, 1984, abandoned, which is a continuation of Ser. No. 401,578, Jul. 26, 1982, Pat. No. 4,481,126. This application Mar. 6, 1986, Ser. No. 836,790
The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.
Int. Cl.[4] C11D *3/37*
U.S. Cl. 252—174.23 **18 Claims**



1. A substantially nonabrasive liquid car cleaner composition consisting essentially of:

I. from 0.1% to 30% by weight of organic polymeric solids selected from the group consisting of:

A. polymeric particles of particle size in the range of from 1 micron to about 150 microns;

B. polymeric fibers of diameter between 1 micron and 50 microns, and length between 0.1 millimeter to 3 millimeters;

said composition having a maximum of 10% of said fibers; and wherein said composition is substantially free of particulate material having a mohs hardness of no greter than 2;

II. from 20% to about 95% of a liquid carrier for said particles, wherein said liquid carrier contains from about 10% to 90% by weight of the composition of an aliphatic hydrocarbon solvent;

III. an organic suspending agent in sufficient amount to suspend said particles in said liquid carrier; and

IV. from 0.1% to 20% by weight of silicone.

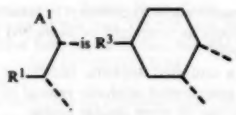
4,693,841
CARBONITRILES

Reinhard Hittich, Modautal; Georg Weber, Erzhausen; Wolfgang Sucrow, and Peter Geschwinder, both of Paderborn, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Nov. 29, 1985, Ser. No. 802,888
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1984, 3443929
Int. Cl.[4] C09K *3/34, 19/32;* C07C *121/46, 121/48*
U.S. Cl. 252—299.62 17 Claims

1. A carbonitrile of the formula

wherein
each of R^1 and R^2 independently is alkyl of 1–12 C atoms, or alkyl of 1–12 C atoms wherein one or two non-adjacent CH_2 groups are replaced by —O—, —O—CO—, —CO—O— or —CH=CH—, and A^1 is H
or

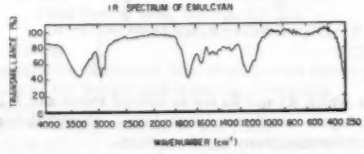


wherein
R^3 is one of the groups defined for R^1.

4,693,842
CYANOBACTERIUM-PRODUCED BIOEMULSIFIER COMPOSITION AND SOLUTION THEREOF

Moshe Shilo, Jerusalem, and Ali Fattom, Maale Hagalil, both of Israel, assignors to Solmat Systems, Ltd., Yavne and Yissum Research Development Company of the Hebrew University of Jerusalem, Jerusalem, both of, Israel

Continuation-in-part of Ser. No. 634,535, Jul. 26, 1984, Pat. No. 4,649,110. This application May 6, 1985, Ser. No. 731,002
Int. Cl.[4] B01F *17/30, 17/34*
U.S. Cl. 252—356 8 Claims



1. A treatment solution containing an extracellular substance formed by a cyanobacterium, having a molecular weight greater than 200,000 Daltons, containing sugar, fatty acid and protein moieties, and amide, carboxylic and amino groups, in an effective concentration capable of causing substantial emulsification of a liquid hydrocarbon into a second liquid.

5. A bioemulsifier composition comprising a substance formed from a cyanobacterium having a molecular weight greater than 200,000 Daltons, containing sugar, fatty acid and protein moieties, and amide, carboxylic and amino groups capable of causing substantial emulsification of a liquid hydrocarbon into a seocnd liquid.

4,693,843
RESISTANCE PASTE

Toru Kasanami, Kyoto; Hiroji Tani, Nagaokakyo; Shizuharu Watanabe, Kyoto, and Toshiaki Ikeda, Ishikawa, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 10, 1986, Ser. No. 838,250
Claims priority, application Japan, Mar. 12, 1985, 60-50184
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—518 4 Claims

1. Resistance paste consisting essentially of conducting powder, glass frit and organic varnish, characterized in that said conducting powder consists essentially of iron oxide, ruthenium oxide and lead oxide, the molar ratio of said three components of the conducting powder being substantially 1:0.6–3:0.2–1 when expressed in terms of Fe_3O_4, RuO_2 and Pb_3O_4, respectively.

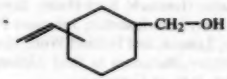
4,693,844
VINYLNORBORNYL ALCOHOL AND PERFUME COMPOSITION CONTAINING THE SAME

Yoshiharu Inoue, Osaka; Fumio Tanimoto, Kyoto, and Hisao Kitano, Osaka, all of Japan, assignors to Nippon Petrochemicals Company Limited, Tokyo, Japan

Filed Nov. 22, 1985, Ser. No. 801,098
Claims priority, application Japan, Nov. 27, 1984, 59-250311
Int. Cl.[4] A61K *7/46;* C11B *9/00;* C07C *35/22*
U.S. Cl. 512—14 2 Claims

1. A vinylnorbornyl alcohol of 5- or 6-vinyl-2-hydroxymethylbicyclo[2.2.1]heptane which is represented by the following structural formula (I):

(I)



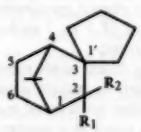
4,693,845
BORNANA-3-SPIRO-1′-CYCLOPENTANES AND PERFUME COMPOSITIONS COMPRISING THE SAME

Yoshiaki Fujikura, Utsunomiya; Akira Yamamuro, Tochigi, and Motoki Nakajima, Saitama, all of Japan, assignors to KAO Corporation, Tokyo, Japan

Filed Jun. 18, 1986, Ser. No. 875,682
Claims priority, application Japan, Jul. 12, 1985, 60-153641
Int. Cl.[4] A61K *7/46;* C11B *9/00;* C07C *35/23, 49/417*
U.S. Cl. 512—9 5 Claims

1. A bornane-3-spiro-1′-cyclopentane derivative of formula (I):

(I)



wherein R_1 and R_2 are such that when R_1 is a hydrogen atom, R_2 is a hydroxyl group, or R_1 and R_2 together form a ketone group.

4,693,846

URETHANE-MODIFIED ROSIN ESTERS

Robert M. Piccirilli; Roger M. Christenson, both of Gibsonia; Frederick A. Falk, Pittsburgh, and Joseph M. Makhlouf, Mars, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 9, 1986, Ser. No. 861,171
Int. Cl.[4] C08L 93/04
U.S. Cl. 260—97 11 Claims

1. A urethane-modified rosin ester comprising a reaction product of:

(a) a hydroxyl-functional rosin esterification product of:

(i) a rosin polyacid comprising a dimerized rosin,

(ii) a polyfunctional alcohol;

(b) an isocyanate.

4,693,847

METHOD OF PREPARING HOT-MELT STABLE ROSIN ESTER WITH ORGANIC ESTER OF HYPOPHOSPHOROUS ACID CATALYST

Robert W. Johnson, Jr., Savannah, Ga., assignor to Union Camp Corporation, Wayne, N.J.

Filed Nov. 14, 1986, Ser. No. 931,552
Int. Cl.[4] C09F 7/00
U.S. Cl. 260—104 9 Claims

1. A method of preparing a polyol ester of rosin, which comprises; esterifying the rosin with the polyol in the presence of a catalytic proportion of an organic ester of hypophosphorous acid.

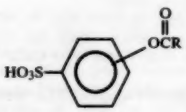
4,693,848

PREPARATION OF ALKALI METAL AND ALKALINE EARTH METAL SALTS OF ACYLOXYBENZENESULFONIC ACIDS

Wolf-Dieter Balzer, Ludwigshafen; Hans-Heinrich Bechtolsheimer, Dittelsheim-Hessloch; Karl-Heinz Beyer, Frankenthal; Rolf Fikentscher, Ludwigshafen; Johannes Perner, Neustadt; Rudi Widder, Leimen, and Helmut Wolf, Hassloch, all of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 662,048, Oct. 18, 1984, Pat. No. 4,588,531. This application Apr. 2, 1986, Ser. No. 847,196
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, 3337921
The portion of the term of this patent subsequent to May 13, 2003, has been disclaimed.
Int. Cl.[4] C07C 143/90, 79/46, 69/76
U.S. Cl. 260—402 6 Claims

1. A process for the preparation of an alkali metal or alkaline earth metal salt of an acyloxybenzenesulfonic acid of formula I:



wherein R is a saturated or unsaturated alkyl radical of 1 to 17 carbon atoms, phenyl or phenyl monosubstituted or disubstituted by an alkyl radical of 1 to 3 carbon atoms, halogen, methoxy or nitro, comprising:

simultaneously adding liquid acyloxybenzenesulfonic acid and a 5–50% strength by weight aqueous solution of an alkali metal or alkaline earth metal hydroxide, carbonate or bicarbonate into water at a temperature of from 0° to 60° C.; and mixing the added ingredients during the addition process such that the acyloxybenzenesulfonic acid is neutralized with the pH of the water medium being maintained from 3.0 to 5.5, thereby forming an aqueous solution having an acyloxybenzenesulfonate salt concentration of 20–60% by weight.

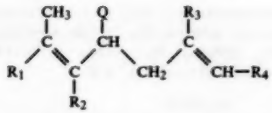
4,693,849

PREPARATION OF UNSATURATED COMPOUNDS

Gerard Mignani, Lyons, and Didier Morel, Villiers sur Orge, both of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

Division of Ser. No. 671,963, Nov. 16, 1984, Pat. No. 4,615,838. This application Sep. 13, 1985, Ser. No. 775,835
Claims priority, application France, Nov. 18, 1983, 83 18392
Int. Cl.[4] C09F 5/00; C07C 67/00, 51/353, 120/00
U.S. Cl. 260—404 7 Claims

1. A process for preparing an unsaturated compound of the formula:



in which Q denotes alkyloxycarbonyl in which the alkyl has 1 to 4 carbon atoms as a straight or branched chain, carboxy, cyano or formyl;

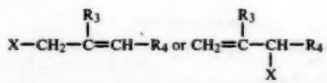
R_1 denotes a saturated aliphatic radical of 1 to 11 carbon atoms or unsaturated aliphatic radical of 2 to 11 carbon atoms and one or more double bonds;

R_2 denotes hydrogen or an alkyl radical of 1 to 4 carbon atoms;

R_3 denoted hydrogen or a saturated aliphatic radical of 1 to 11 carbon atoms; and

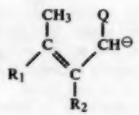
R_4 denotes hydrogen, a saturated aliphatic radical of 1 to 11 carbon atoms which is unsubstituted or substituted by acetyl, formyl which may be in the form of an acetal radical, hydroxy which may be in the form of an ether or ester, or an unsaturated aliphatic radical of 2 to 11 carbon atoms and one or more double bonds, which is unsubstituted or substituted by acetyl, formyl wich may be in the form of an acetal radical, or hydroxy which may be in the form of an ether or ester;

which comprises reacting a compound of the formula:



in which R_3 and R_4 are as defined above and X denotes halogen, methanesulphonyloxy, phenylsulphonyloxy, p-toluenesulphonyloxy or acetoxy,

with a carbanion of the formula:



in which Q, R_1 and R_2 are defined above in the presence of a catalyst based on palladium combined with a ligand in a non-polar aprotic solvent at a temperature of between −70° and +100° C.

4,693,850

METHANE SULFONIC ACID DERIVATIVES

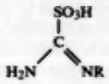
Cynthia A. Maryanoff, Solebury Township, Bucks County; James N. Plampin, Roslyn, and Robin C. Stanzione, West Chester, all of Pa., assignors to McNeilab, Inc., Fort Washington, Pa.

Division of Ser. No. 711,948, Mar. 15, 1985, Pat. No. 4,656,270. This application Nov. 26, 1986, Ser. No. 935,667

Int. Cl.[4] C07C *143/56*

U.S. Cl. 260—506 5 Claims

1. A N-arylformamidinesulfonic acid of the following formula (I):



(I)

wherein R is phenyl, methylenedioxyphenyl, phenyl substituted with from 1 to 3 halo substituents or phenyl substituted with a member selected from the group consisting of dimethylamino, methylethylamino, diethylamino, loweralkanoylamino, loweralkylthio, trifluoromethyl, hydroxy, benzyloxy, loweralkanoyloxy, loweralkanoyl and nitro.

4,693,851

PURIFICATION OF ACID HALIDES

Mark A. Bannick, San Jose; George A. Divers, III, San Francisco, and Viktors Jansons, Los Gatos, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 721,525, Apr. 9, 1985. This application Feb. 28, 1986, Ser. No. 834,703

Int. Cl.[4] C07C *51/64*

U.S. Cl. 260—544 D 11 Claims

1. A method of purifying an aromatic carboxylic acid halide comprising the steps of

(a) adding a acidic molecular sieve catalyst which is a crystalline aluminosilicate, silicoaluminophosphate, or aluminophosphate in acid form or a salt with a group IA or group IIA element, or a silica polymorph, in an amount between about 0.001 to about 10% by weight to said aromatic carboxylic acid halide;

(b) heating the resulting mixture of said acidic catalyst and said acid halide to a temperature of about 180° C. to about 250° C. for a period of at least of 0.5 hrs;

(c) distilling the mixture to obtain acid halide substantially free of aldehyde and the halo derivative thereof.

4,693,852

DROPLET INJECTION SYSTEM FOR EVAPORATIVE COOLING OF ANIMALS

Larry R. Gordon, 1612 E. First St., Mesa, Ariz. 85203

Filed Nov. 4, 1986, Ser. No. 926,524

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—30 2 Claims

1. Apparatus for directing a flow of air toward and over an animal to cool the animal, said apparatus comprising

a. a frame;

b. a hollow housing attached to said frame;

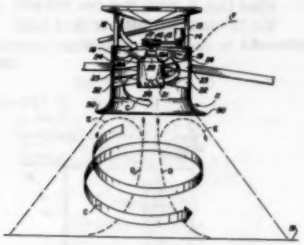
c. a hollow member positioned inside and connected to said housing;

d. means attached to said frame for directing an inner flow of air through said hollow member and an outer flow of air through said housing toward said animal;

e. means for injecting water droplets into air directed into said apparatus by said air flow means;

f. a plurality of spaced apart radially extending members intermediate said housing and said hollow member for causing said outer flow of air to have an angular velocity and to move through said housing in a rotary direction of travel about an axis, said outer flow of air generally circulating about and defining an inner area;

g. a plurality of spaced apart radially extending members inside said hollow member for causing said inner flow of air to have an angular velocity and move through said hollow member in a rotary direction of travel generally



corresponding to said rotary direction of travel of said outer flow of air; and,

h. said inner air flow generally preventing air from being drawn into said inner area away from said animal.

4,693,853

ANESTHETIC VAPORIZER

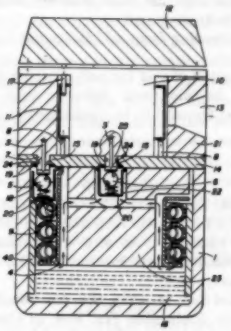
Wolfgang Falb, Krummesee; Martin Ryschka, Stockelsdorf, and Carl-Friedrich Wallroth, Lübeck, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 27, 1986, Ser. No. 879,326

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1985, 3523947

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—39.1 5 Claims



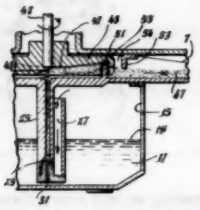
1. An anesthetic vaporizer, comprising a vaporizer housing having an interior liquid anesthetic reservoir, an intermediate plate closing said housing having a plurality of receiving openings, a proportioning unit having fluid transmitting projections of corresponding numbers as the openings, said fluid transmitting projections being positionedd to engage into the openings upon joining of the proportioning unit to the vaporizer housing, a flow passage being defined from a gas inlet to said reservoir through said fluid transmitting projection to a flow passage extending back into said proportioning unit, and a gas setting unit in said proportioning unit adapted to the release of the respective anesthetic used, marking means engaging into the proportioning unit for adaption of the setting means in said unit, said marking means being in the form of a marking pin and said gas setting means including a scale means for providing an indication of the anesthetic, operatively connected in said proportioning unit so as to be displaceable in an axial direction.

4,693,854

GENERATOR FOR HAIR STYLING MOUSSE

Yuk M. Yau, Shatin, Hong Kong, assignor to Conair Corporation, Edison, N.J.

Filed Oct. 6, 1986, Ser. No. 915,695
Int. Cl.[4] B01F 3/04
U.S. Cl. 261—84 10 Claims



1. A styling mousse generator adapted to foam a liquid and deliver foamed mousse for use in hair treatment and the like, said mousse generator including

a housing including a liquid reservoir in the lower portion thereof, means for filling said reservoir, a foam outlet leading from said housing,

a fan and motor positioned within said housing and above said reservoir, said fan having a fan inlet and a fan outlet, and a foam delivery tube leading from the lower portion of said reservoir to said fan inlet, said foam delivery tube including a liquid inlet duct proximate to the lower end thereof for receiving liquid from said reservoir,

an air inlet tube associated with said foam delivery tube and having its air inlet end above the expected liquid levels of said reservoir, at least one air inlet duct leading from said air inlet tube into said foam delivery tube proximate to said liquid inlet duct, and

a passageway leading from said fan outlet to said foam outlet,

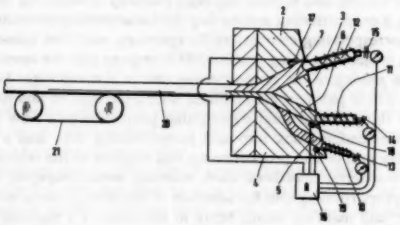
whereby actuation of said fan will cause air and liquid to be intermixed in said foam delivery tube, to be drawn through said fan, and to be discharged through said foam outlet.

4,693,855

METHOD FOR REDUCING WASTAGE IN A MULTIPLE-HEAD EXTRUSION DEVICE

Adolf Herbert, Hanover, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Sep. 11, 1986, Ser. No. 906,289
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1985, 3534770
Int. Cl.[4] B29C 47/92
U.S. Cl. 264—40.7 2 Claims



1. A method of reducing the wastage during the start-up phase of an extrusion device used to produce extruded profiles from a plurality of mixtures, said extrusion device comprising a plurality of extruders, each said extruder extruding a different one of said mixtures and comprising an inlet end region and an outlet end region disposed remote from said inlet end region, separate drive means driving each said extruder, pressure sensor means disposed in said outlet end region of each said extruder for measuring the pressure of said mixture emerging from said extruder, a template member defining flow channels for receiving the individual outputs from said extruders, a common extrusion port fed by said flow channels and control mens operatively connected to each said pressure sensor means and to each said drive means, said control means including comparator means for comparing said measured pressures with pre-determined desired pressures, and means for actuating and de-actuating each said drive means in dependence upon said measured pressures, said method comprising the steps of

(a) actuating all of said drive means simultaneously to cause each said extruder to commence extruding a different one of said mixtures,

(b) monitoring the pressure of each mixture being extruded utilising said pressure sensor means,

(c) comparing each said measured pressure with said predetermined desired pressures utilising said comparator means, said control device causing de-actuation of said drive means for each said extruder when the pressure of material extruded by said extruder is equal to said predetermined desired pressure, and

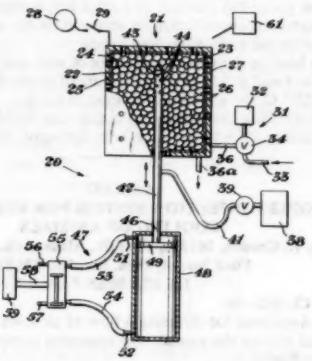
(d) re-actuating all said drive means when all of said predetermined desired pressures have been attained.

4,693,856

METHOD AND APPARATUS FOR THE PREPARATION OF FOAMED THERMOPLASTIC ARTICLES

Louis C. Rubens; Willard E. Alexander, both of Midland, and Carl A. Raeck, Essexville, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 22, 1985, Ser. No. 725,952
Int. Cl.[4] C08J 9/22
U.S. Cl. 264—45.4 15 Claims



1. A method for the molding of expanded synthetic resinous thermoplastic articles from a plurality of synthetic resinous particles, the steps of the method comprising providing a plurality of foamed synthetic resinous particles, introducing into the said foamed particles an expanding agent in a quantity sufficient that on heating said particles to a foaming temperature their volume will increase by a factor of at least 1.7;

disposing said particles within a mold having an inner molding surface;

introducing a heated gas substantially devoid of steam, which is a nonsolvent for the particles at at least one location generally remote from the inner surface of the mold, the heated gas being at a temperature sufficient to cause the particles to expand and adhere to one another,

permitting said heated gas to escape from the mold; heating at least a major portion of an internal surface of the mold to a temperature to cause expandable particles adjacent thereto to expand and thereby provide a unitary synthetic resinous foam article.

4,693,857

METHOD FOR PRODUCTION OF SINTERED ARTICLE OF SILICON NITRIDE

Katsutoshi Komeya, Ohiso, and Michiyasu Komatsu, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Mar. 26, 1985, Ser. No. 716,212
Claims priority, application Japan, Mar. 29, 1984, 59-61821
Int. Cl.[4] C04B *33/32*
U.S. Cl. 264—56 3 Claims

1. An aqueous slurry method for the production of a sintered article of silicon nitride (Si_3N_4) comprising the steps of:

mixing silicon nitride powder with from 0.5 to 10% by weight, based on the powdered mixture, of a powdered spinel type compound having oxygen dissolved in aluminum nitride to form a solid solution having the formula

$$(AlN)_x(Al_2O_3)_y$$

wherein x and y each has a value in the range of 0.8 to 1.2;

converting the resultant powdered mixture into an aqueous slurry mixture; molding said aqueous slurry mixture into a prescribed shape; and

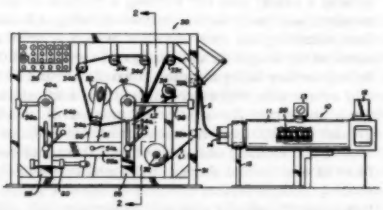
sintering the resultant shaped mixture.

4,693,858

METHOD OF PROCESSING HYDROCOLLOID DRESSINGS

Robert W. Volke, Garrettsville, Ohio, assignor to Variseal Manufacturing Corp., Parkman, Ohio

Filed Apr. 25, 1986, Ser. No. 855,716
Int. Cl.[4] B29C *47/88*
U.S. Cl. 264—101 7 Claims



1. A method of processing hydrocolloid adhesive material, comprising the steps of:

(A) extruding a sheet of the adhesive material having an initial uneven surface topography from a vacuum extruder;

(B) applying a liner of release material, under constant pressure, to at least one side of said sheet while the adhesive is at an elevated temperature to thus laminate said liner and said sheet under said pressure to compress said sheet and smooth the initial uneven surface topography thereof;

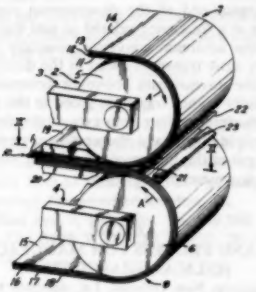
(C) maintaining said liner and said adhesive sheet under tension during cooling thereof.

4,693,859

METHOD FOR CONTINUOUS HEATED PRESSING OF MATERIAL IN SHEET FORM

Kurt Held, Alte Strasse 1, D-7218 Trossingen 2, Fed. Rep. of Germany

Filed May 3, 1985, Ser. No. 730,328
Claims priority, application Fed. Rep. of Germany, May 8, 1984, 3416985
Int. Cl.[4] B30B *5/06*
U.S. Cl. 264—112 1 Claim



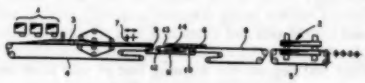
1. In a method for the continuous pressing of material sheeting in a double band press including a pair of deflecting drums, each rotating about parallel axes and defining therebetween a reaction zone within which said material sheeting is pressed, each of said drums having an outer circumference and a pair of endless press belt packs, each extending, respectively, about one of said drums, each of said packs being composed of a plurality of individual press belts, said press belt packs each having an internal side engaging against one of said drums and an external side brought into engagement with material sheeting during pressing thereof in said reaction zone, the improvement comprising that said press belt packs are continuously heated by application of heat to said internal sides thereof before reaching said reaction zone and that said external sides thereof are continuously maintained at a temperature higher than the temperature of said internal sides by continuous heating thereof at a location shortly before reaching said reaction zone, with heat flow through each of said press belt packs continuously occurring with a high heat resistance from the external side thereof to the internal side as a result of continuous maintenance of a temperature gradient thereacross.

4,693,860

METHOD OF CONVEYING PARTICULATE MATS

Werner Thelen, Kempen, Fed. Rep. of Germany, assignor to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Division of Ser. No. 767,956, Aug. 21, 1985. This application Aug. 19, 1986, Ser. No. 898,036
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1984, 3431126
Int. Cl.[4] B29C *59/04;* B65G *47/64*
U.S. Cl. 264—320 2 Claims



1. A method of conveying particulate mats from the downstream end of an upstream conveyor normally moving continuously in a longitudinal transport direction at a predetermined relatively slow speed to a press downstream in the direction

from the upstream conveyor that receives the mats and presses them into hard panels, the method comprising the steps of:

supporting the mats between the upstream conveyor and the press on a downstream conveyor having an upstream end spaced downstream from the downstream end and a downstream end at the press and an intermediate conveyor extending between the upstream end of the downstream conveyor and the downstream end of the upstream conveyor and having a length in the direction at least equal to that of each of the mats in the direction;

reciprocating a carriage supporting the downstream end of the upstream conveyor, the intermediate conveyor, and the upstream end of the downstream conveyor in the direction at a frequency related to mat size and speed;

operating the upstream conveyor generally only at a first relatively slow transport speed in the direction;

operating the downstream conveyor generally always at a substantially higher transport speed in the direction; and

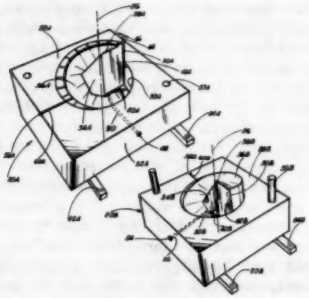
operating the intermediate conveyor at the slow speed when a mat is bridging it and the upstream conveyor and for operating it at the higher speed when a mat is bridging it and the downstream conveyor.

4,693,861

MOLD AND PROCESS FOR MANUFACTURING HELICAL SHAPED ITEMS

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, Harahan, La.

Filed Apr. 9, 1984, Ser. No. 598,374
Int. Cl.[4] B29C *45/36*
U.S. Cl. 264—328.1 **32 Claims**



1. A reusable mold for forming, from a selected material, a helical shaped device enclosed in a cylinder which includes an axial member having a first and second end integrally joined with a helical shaped flight member extending a selected distance radially from a center line of said axial member and having front and back surfaces, said flight member further extending an axial distance substantially equal to the length of said axial member and up to 360 degrees coaxially around said axial member, said mold having a center axis and comprising:

a first section partially defining an elongated cavity portion extending along and around said center axis for forming a portion of said axial member, said first section further defining a helical surface extending an axial distance substantially equal to the length of said axial member, said helical surface being disposed coaxially around and along said center axis and extending said selected distance radially therefrom for a selected amount of rotation no greater than 360 degrees for forming one of said front and back surfaces of said helical shaped flight member;

a second section adapted for reciprocating movement along said center axis between an open and closed position with respect to said first section, said second section partially defining said elongated cavity portion extending along and around said center axis for forming another portion of said axial member, said second section further defining a helical surface extending an axial distance which is substantially equal to the length of said enlongated cavity portion and disposed coaxially around and along said center axis and extending said selected distance radially therefrom for said selected amount of rotation for forming the other one of said front and back surfaces of said helical shaped flight member;

said first and second sections cooperating such that when in said closed position, said helical surfaces of each section are substantially parallel to each other, and are maintained at a selected and constant spacing, so that said sections define an enclosed cavity having an elongated axial portion and a helical shaped flight portion, said helical shaped flight portion extending an axial distance which is substantially equal to said elongated axial portion and having a selected cross-section extending radially a selected distance from said center axis and coaxially therewith for said selected amount of rotation, said first and second section further defining an annular shaped aperture located coaxially with said center axis, and said annular aperture having an inside radius equal to said selected distance;

at least one of said first and second sections defining a passageway extending from said enclosed cavity to the outside of said mold such that said selected material may be transferred from outside of said mold to fill said cavity and integrally form said helical shaped flight member, said enclosing cylinder, and said axial member; and

said mold sections further cooperating such that said helical shaped device formed in said cavity may be removed by moving said second section along said center axis to said open position without twisting.

22. A method for producing a helical shaped device enclosed in a cylinder including an axial member having a first and second end integrally joined with a helical shaped flight member extending a selected radial distance from said axial member and having front and back surfaces, said flight member extending an axial distance which is substantially equal to the length of said axial member and up to 360 degrees coaxially around said axial member, said method comprising the steps of:

providing a reusable mold having first and second sections wherein each of said sections include a center axis, such that when said center axis of each of said first and second sections are coaxial with each other, said two sections are adapted for reciprocating movement with respect to each other between an open and closed position, along said center axis, each of said first and second sections partially defining an elongated cavity portion extending along and around a center axis for forming a portion of said axial member, and each section further defining a helical surface extending an axial distance which is substantially equal to the length of said elongated cavity portion, said helical surface being disposed coaxially around and along said center axis, and extending radially said selected distance therefrom for a selected amount of rotation no greater than 360 degrees, one each of said surfaces of said section for forming one each of said front and back surfaces of said helical shaped flight member, said first and second sections further defining an annular shaped aperture located coaxially with said center axis, and said annular aperture having an inside radius equal to said selected radial distance;

supporting said first and second sections such that said center axis of each section are parallel and in register;

moving at least one of said first and second sections with respect to the other section along said coaxially aligned center axis to said closed position without twisting such that said helical surfaces of each section are parallel to each other and are maintained at a selected and constant spacing so that said sections define an enclosed cavity having an elongated axial portion and a helical shaped flight portion extending an axial distance which is substantially equal to the length of said elongated axial portion,

and a selected cross-section extending radially said selected distance therefrom and coaxially with said axial portion for said selected amount of rotation;

injecting an amount of selected material at a selected temperature and pressure into said enclosed cavity through a gate extending from a source outside of said cavity sufficent to fill said enclosed cavity;

subjecting said first and second section to a selected amount of force parallel to said aligned center axis to maintain said sections in said closed position during said injection of said selected material;

curing said injected material to form a helical shaped device conforming to said cavities;

moving at least one of said sections along said center axis to said open position without twisting; and

removing said formed helical shaped device from said mold.

4,693,862

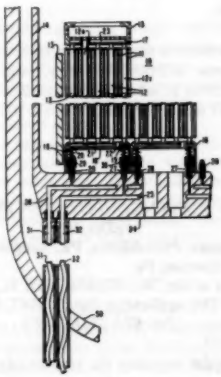
GAS DISPLACEMENT SPECTRAL SHIFT REACTOR AND CONTROL METHOD

Stephen N. Tower, Washington Township, Westmoreland County; Howard E. Braun, Pittsburgh; David E. Boyle, Kiski Township, Armstrong County, and Robert B. Salton, Plum Boro, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 2, 1984, Ser. No. 626,846

Int. Cl.[4] G21C *1/00, 3/32*

U.S. Cl. 376—209 **7 Claims**



1. In a liquid moderated, pressurized water nuclear reactor having initial excess reactivity, said reactor having a core formed from a plurality of fuel assemblies, each fuel assembly having fuel rods structurally supported between top and bottom nozzles, with said core being positioned within a pressure vessel between upper and lower core support plates, a method of extending core life by spectral shift comprising the steps of:

displacing a portion of the liquid moderator in the core by a gas having a low neutron absorption cross-section, from a gas supply outside said pressure vessel, during the initial stage of the life of the core by introducing said gas, from inlet flow channels in one of said core support plates, into a plurality of hollow, moderator displacement elements comprising hollow rods, sealed from reactor primary coolant flow, disposed among and arranged coextensively with fuel rods within the core, where the gas is introduced from said inlet flow channels through a first seal connector into a lower end of a first of said hollow, moderator displacement elements, and displacing said liquid moderator through the upper end of said first element;

forming a gas liquid interface at the upper end of said plurality of hollow, moderator displacement elements;

displacing the liquid moderator from within the remainder of said hollow, moderator displacement elements by said gas, from the upper end of said first element, by displacing the liquid moderator from the upper end through the lower end of said remainder of said hollow, moderator displacement elements, with said gas exiting from said remainder of said hollow, moderator displacement elements through a second seal connector, and through outlet flow channels in said one of said core support plates, with both of said seal connectors being located at the same horizontal core level, the upper ends of said hollow, moderator displacement elements being flow connected, thereby trapping said gas within said moderator displacement elements; and

replacing said gas with liquid moderator, from a liquid moderator supply outside said pressure vessel, during the latter part of the life of the core.

4,693,863

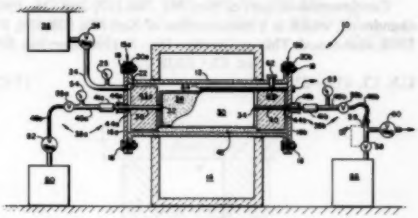
PROCESS AND APPARATUS TO SIMULTANEOUSLY CONSOLIDATE AND REDUCE METAL POWDERS

Gregory J. Del Corso, Sinking Spring; Robert E. Carnes, and David Esposito, both of Reading, all of Pa., assignors to Carpenter Technology Corporation, Reading, Pa.

Filed Apr. 9, 1986, Ser. No. 849,809

Int. Cl.[4] B22F *3/14;* **C22C** *29/02, 29/16*

U.S. Cl. 419—13 **39 Claims**



1. In a process for making an integral, mechanically hot workable metal body from powder, the steps of

providing a porous charge of metal powder particles having a predetermined composition and volume;

forcing a reactive fluid to flow into an inlet portion of the charge while confining the reactive fluid to the volume of the charge, such that it substantially completely permeates the pores of said charge and flows out of an outlet portion thereof;

heating said charge to a consolidation temperature at which solid state sintering of the metal powder particles occurs but below the incipient melting point of the metal powder while said reactive fluid is in contact with said metal powder and thereby modifying the chemistry of at least the surfaces of the metal powder particles in a predetermined manner;

applying an external force to said charge as it is heated, so as to partially compact it while leaving it porous to the reactive fluid flowing therethrough said external force being distinct from any force caused by the flow of the reactive fluid through said charge

thereafter removing said reactive fluid from said metal powder charge; and then

further compacting the metal powder to a density greater than about 90% of the full theoretical density of said predetermined composition.

33. Apparatus for producing an integral, mechanically hot workable metal body from powder, comprising

a muffle for receiving a porous charge of metal powder of a predetermined composition and volume;

means for sealing said muffle gastight with said metal powder charge therein;

first conduit means for providing communication between

an inlet portion of said metal powder charge and a source of reactive fluid;

second conduit means for providing communication between an outlet portion of said metal powder charge and a vacuum system;

said first and second conduit means communicating with each other through said metal powder charge so that the reactive fluid is forced to flow through said metal powder charge, such that it substantially completely permeates the pores of said charge;

means for confining the reactive fluid flow to the volume of the metal powder;

means for heating said metal powder charge in said muffle to a preselected consolidating temperature while the reactive fluid is flowing through the metal powder charge; and

means for compacting said metal powder while heating it and while maintaining the flow of reactive fluid therethrough.

4,693,864

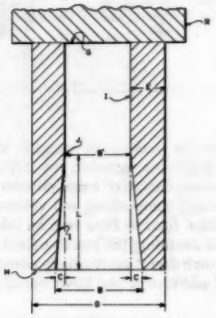
POWDER METALLURGY PROCESS FOR PRODUCING STEEL ARTICLES

Donald W. Lloyd, Dunedin Beach, Fla., assignor to Donald W. Lloyd Realty, Inc., Clearwater, Fla.

Continuation-in-part of Ser. No. 748,167, Jun. 24, 1985, abandoned, which is a continuation of Ser. No. 578,533, Feb. 9, 1984, abandoned. This application Dec. 5, 1985, Ser. No. 804,874

Int. Cl.[4] B22F *1/00*

U.S. Cl. 419—23 **17 Claims**



1. A process for producing a powder metallurgy article substantially free of non-metallic stringers, which process consists essentially of the steps

(A) grinding mill scale into a finely divided particulate,

(B) completely reducing the particulate mill scale to form substantially pure iron in a single step,

(C) forming a particulate admixture consisting essentially of the substantially pure iron, manganese, and carbon,

(D) admixing a binder with said particulate admixture to form a bonded particulate admixture,

(E) compressing saidi bonded particulate admixture into a coherent mass having a density of from about 6.67 g/cm^3 to about 7.83 g/cm^3,

(F) heating said coherent mass in a non-oxidizing atmosphere at elevated temperature to sinter said coherent mass, thereby forming a sintered mass having structural integrity,

(G) heating said sintered mass in a non-oxidizing atmosphere to a temperature just below the fusion temperature of iron, thus forming an alloyed article, and

(H) working said alloyed article at elevated temperature to decrease its grain size.

4,693,865

SUPERCONDUCTIVE ALLOY FILAMENT

Tomoko Goto, Nagoya, Japan, assignor to Nagoya Institute of Technology, Nagoya, Japan

Filed Mar. 5, 1986, Ser. No. 836,443

Claims priority, application Japan, Apr. 2, 1985, 60-68568

Int. Cl.[4] C22C *11/08*

U.S. Cl. 420—572 **7 Claims**

1. A superconductive alloy continuous filament with a high superconducting transition temperature (T_c) and high strength and ductility, which comprises a ternary alloy with a composition represented by the general formual:

$$Pb_x.Bi_y.M_z \qquad (I)$$

where, M represents a metallic element selected from Te and Sb; x is an atomic % from 30 to 80; y, from 15 to 55 when M is Te, or from 20 to 50 when Sb; z, from 2 to 25 when M is Te, or from 5 to 30 when Sb; and $x+y+z=100$.

4,693,866

METHOD OF SCAVENGING OXYGEN FROM AQUEOUS MEDIUMS

Nancy A. Feldman, Philadelphia, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Continuation of Ser. No. 673,693, Nov. 21, 1984, Pat. No. 4,657,740. This application Jan. 9, 1987, Ser. No. 1,617

Int. Cl.[4] C23F *11/06*

U.S. Cl. 422—13 **7 Claims**

1. A method for reducing the amount of oxygen in an oxygen containing aqueous medium comprising adding to said aqueous medium, as the sole oxygen scavenger, an effective amount for the purpose of a solution comprising pentaethylenehexamine or water soluble salt thereof.

4,693,867

MINERALIZATION APPARATUS FOR THE INDIVIDUAL, AUTOMATIC, TREATMENT OF SAMPLES OF PRODUCTS PLACED IN RECIPIENTS

Roger Commarmot, Lyons; Dominique Didenot, Meyzieu, and Jean-Francois Gardais, Chuzelles, all of France, assignors to Societe Prolabo (Societe Anonyme), France

Filed Feb. 27, 1985, Ser. No. 706,338

Claims priority, application France, Mar. 5, 1984, 84 03571

Int. Cl.[4] G01N *31/12*; H05B *6/64*

U.S. Cl. 422—64 **15 Claims**

1. A mineralization apparatus for the individual, automatic, treatment of samples comprising:

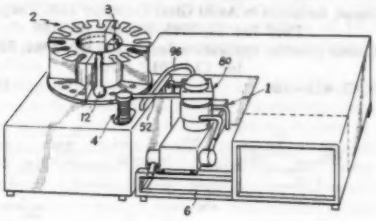
a micro-wave generator for emitting micro-waves into a micro-wave heating chamber,

a plurality of sample container means each having an enlarged sample containing portion at a lower end thereof

and an upwardly extending neck portion connected thereto,

a micro-wave heating chamber adapted to receive the sample containing portion of one of said plurality of sample container means said micro-wave heating chamber comprising a housing having an upper wall and defining in said upper wall an opening through which said sample containing portion of said sample container means can be placed in and removed from said chamber,

a stack bordering said opening in said upper wall of said micro-wave heating chamber adapted to surround the upwardly extending neck portion of said sample container means when the sample containing portion is placed in said micro-wave heating chamber,



a transport station for receiving said sample container means,

means for randomly supplying sample container means in individual housings, in random succession and individual presentation to said transport station,

means for detecting at least one characteristic of treatment specific to each sample transported to the transport station in sample container means,

means at said transport station for individual transfer of sample container means between said container supply means and the micro-wave heating chamber, and

means for controlling the automatic operation of the apparatus in a cycle specific to each sample based upon the at least one characteristic of treatment specific to each sample detected.

4,693,868

THERMAL FUMIGATOR FOR DRUGS

Yoshio Katsuda, Nishinomiya; Sadao Yoshinaga, Ichikawa, and Hiroyoshi Mashine, Souka, all of Japan, assignors to Dainihon Jochugiku Co., Ltd., Japan

PCT No. PCT/JP83/00323, § 371 Date May 9, 1984, § 102(e) Date May 9, 1984, PCT Pub. No. WO84/01264, PCT Pub. Date Apr. 12, 1984

PCT Filed Sep. 30, 1983, Ser. No. 611,037

Claims priority, application Japan, Sep. 30, 1982, 57-148579[U]; Sep. 30, 1982, 57-148580[U]; Sep. 30, 1982, 57-148581[U]; Oct. 4, 1982, 57-174295; Oct. 8, 1982, 57-153100[U]; Oct. 8, 1982, 57-177050; Nov. 8, 1982, 57-169122[U]; Nov. 8, 1982, 57-169123[U]; Jan. 6, 1983, 58-373[U]; Jan. 6, 1983, 58-374[U]; Feb. 16, 1983, 58-20971[U]; Sep. 26, 1983, 58-177647

Int. Cl.⁴ A61L *9/04*

U.S. Cl. 422—124 **18 Claims**

1. A thermal fumigator for the vaporization of a drug, comprising:

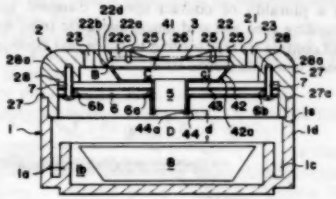
a fumigator case having a gas passage formed therein;

a fuel receptacle disposed within a lower portion of said fumigator case;

a volatile fuel within said fuel receptacle;

a support member mounted within said fumigator case above said fuel receptacle, said support member comprising a catalyst retaining part and a metal catalyst retained within said catalyst retaining part, said metal catalyst being located at a first predetermined distance above an upper surface of said fuel receptacle, and a heat radiating plate located at a second predetermined distance above said metal catalyst; and

a mat supported by said heat radiating plate, said mat being impregnated with a vaporizable drug;



wherein vapors rising from said volatile fuel contact said metal catalyst and generate a heat of reaction which is transferred to said heat radiating plate, whereby said mat is heated and said drug is vaporized.

4,693,869

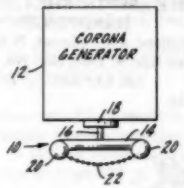
ELECTRODE ARRANGEMENT FOR CREATING CORONA

Ernest H. Pfaff, 1549 Woodvale Ave., Deerfield, Ill. 60015

Filed Mar. 20, 1986, Ser. No. 841,847

Int. Cl.⁴ B01J *19/08, 19/12;* H01J *1/88, 19/42*

U.S. Cl. 422—186.04 **19 Claims**



1. An electrode arrangement for creation of a corona, the electrode arrangement being configured for attachment to a high frequency electrical corona generator generating frequencies on the order of 2 MHz and being made of an electrically conductive material, the electrode arrangement comprising:

a. a stem for attachment to the corona generator,

b. a corona driving element secured to said stem, and

c. a corona emitting element in electrical contact with said corona driving element,

d. said corona driving element being greater in size than said corona emitting element such that corona from the electrode arrangement is emitted essentially from said corona emitting element in a direction away from said corona driving element.

4,693,870

TUBULAR OZONIZER WITH COOLED INNER ELECTRODE

Urs Gloor, Baden; Michael Hirth, Unterentfelden, and Ulrich Kogelschatz, Hausen, all of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jun. 18, 1985, Ser. No. 746,122

Claims priority, application Switzerland, Jun. 27, 1984, 3106/84

Int. Cl.⁴ B01J *19/08*

U.S. Cl. 422—186.19 **21 Claims**

1. A tubular ozoniser comprising:

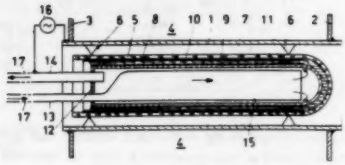
(a) an outer, electrically conductive tube;

(b) an inner, dielectric tube disposed within but spaced from said outer, electrically conductive tube, the space between

the outside of said inner, dielectric tube and the inside of said outer, electrically conductive tube comprising a discharge gap;

(c) a cooling tube disposed within but spaced from said inner, dielectric tube;

(d) a plurality of contact springs disposed between said cooling tube and said inner, dielectric tube, said plurality of contact springs serving to space said cooling tube from said inner, dielectric tube;



(e) a coating of a thermally conductive material formed on the outside of said cooling tube and extending outwardly to within a few 10 μm of the inside of said inner, dielectric tube, the space between the outside of said coating of thermally conductive material and the inside of said inner, dielectric tube comprising a thermal expansion gap; and

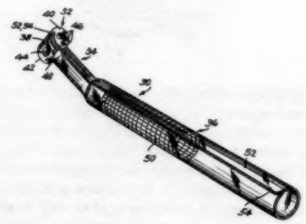
(f) first means for conducting a cooling fluid through said cooling tube.

4,693,871

DISPOSABLE ASEPTIC SHEATH FOR DENTAL HANDPIECES

Paul Geller, 4 Holland Ave., Elmont, N.Y. 11003

Filed Apr. 9, 1986, Ser. No. 849,808
Int. Cl.[4] A61C *1/16*
U.S. Cl. 433—116 **6 Claims**



1. A disposable aseptic sheath for a dental handpiece having a head, neck and handle, said sheath adapted for substantially completely enclosing the handpiece therewithin during use to prevent the handpiece from becoming contaminated, comprising:

a forward substantially cylindrical and rigid head portion for receiving the head of the handpiece;

an intermediate substantially cylindrical and rigid neck portion integral with said head portion for receiving the neck of the handpiece, said neck portion having two ends and being joined to said head portion at one of said ends;

a rearward substantially cylindrical and rigid handle portion integral with said neck and head portions for receiving the handle of the handpiece, said handle portion being joined to the other of said ends of said neck portion;

said head, neck and handle portions being formed from a unitary, elastically deformable sheet of resilient thermoplastic material having a thickness in the range of between about 0.002 to 0.060 inches; and

said sheath including a pair of edge regions extending substantially longitudinally over said neck and handle portions in normally mutual overlapping relationship over at least a portion of their lengths, said overlapping edge regions being forceably separable out of overlapping relationship to form a space between them extending longitudinally over said neck and handle portions providing access for substantially lateral insertion of the handpiece into:the interior of said sheath,

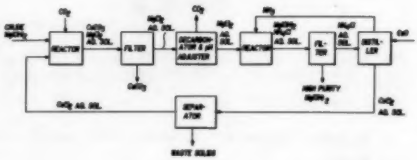
whereby upon insertion of the handpiece, said edge regions return into said mutual overlapping relationship due to the resilience of said sheet material of which said sheath is formed.

4,693,872

PROCESS FOR PRODUCING HIGHLY PURE MAGNESIUM HYDROXIDE

Keiichi Nakaya, Chiba, and Kunio Tanaka, Ichihara, both of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Jan. 22, 1985, Ser. No. 693,159
Claims priority, application Japan, Jan. 20, 1984, 59-7049
Int. Cl.[4] C01F *11/04*
U.S. Cl. 423—164 **12 Claims**



1. A process for producing highly pure magnesium hydroxide, which comprises the steps of:

reacting magnesium hydroxide starting material containing impurities, with an aqueous solution containing a water-soluble calcium salt and carbon dioxide to form an aqueous solution containing a magnesium salt and calcium carbonate precipitates whereby said impurities are transferred to the precipitates,

filtering off said precipitates,

decarbonating said filtered aqueous solution at a pH of from 1–5,

reacting said decarbonated aqueous solution containing said magnesium salt, with ammonia to form a slurry comprising magnesium hydroxide solid and an aqueous solution containing an ammonium salt, and

filtering the slurry to obtain highly pure magnesium hydroxide solid and an aqueous solution containing said ammonium salt.

4,693,873

HCN AND IRON CYANIDE COMPLEX REMOVAL

Daniel C. Baker, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 30, 1985, Ser. No. 814,708
Int. Cl.[4] B01D *45/00, 47/00;* C01C *3/00*
U.S. Cl. 423—215.5 **2 Claims**

2. A process for scrubbing a synthesis gas stream containing residual amounts of iron containing particulate solids and minor amounts of HCN comprising

(a) contacting said synthesis gas stream in a scrubbing zone with an aqueous solution containing a reactant having the formula

$$R_1-\underset{\underset{O}{\|}}{C}-R_2$$

wherein R_1 and R_2 are hydrogen or alkyl containing 1 through 3 carbon atoms, provided that R_1 and R_2 are never simultaneously alkyl, precursors thereof, and mixtures of said compounds, precursors, and compounds and

precursors; in an amount sufficient to remove at least the bulk of HCN, under conditions to convert HCN, and producing a partially-purified synthesis gas stream having reduced HCN content and a first aqueous mixture containing solids, reaction products of HCN and said reactant, and iron cyanide complex or complexes;

(b) contacting said partially-purified gas stream in said scrubbing zone with an effective amount of an aqueous solution containing a second reactant selected from ammonium polysulfide, sodium polysulfide, and a mixture of ammonium polysulfide and sodium polysulfide, under conditions to convert HCN, the reactant being present in solution in an amount in excess of that required to react stoichiometrically with the HCN; producing a purified gas stream with a further reduced HCN content; a second aqueous mixture containing reaction products of HCN and said second reactant, and iron cyanide complex or complexes;

(c) removing and combining the first and second aqueous mixtures from the scrubbing zone, and continuing contact of the second reactant with the combined mixture in a conversion zone, the conversion zone being at a temperature of from about 110° C. to about 180° C., and converting iron cyanide complex or complexes in said mixture and producing a mixture having a reduced iron cyanide complex or complexes content.

4,693,874

METHOD FOR REDUCING GAS TURBINE NO_x EMISSIONS

Boyd E. Hurst, 21 Wherli Rd., Long Valley, N.J. 07853

Filed Mar. 22, 1985, Ser. No. 715,168

Int. Cl.[4] C01B *21/00*; B01J *8/00*

U.S. Cl. 423—235 **16 Claims**

1. A process for reducing NO_x concentration in a combustion effluent containing at least 0.1 volume percent O_2 comprising the step of contacting said effluent with ammonia at a temperature in the range of about 1100° K. to about 1500° K. and at a pressure in the range of above 1 to 100 atmospheres, said contacting being carried out at a residence time of above 2 to about 75 milliseconds such that a reduction of NO_x in the combustion effluent is realized which is greater than that achieved by carrying out the process under substantially similar conditions but at atmospheric pressure.

4,693,875

PROCESS FOR RECOVERY OF HYDROGEN AND ABSTRACTION OF SULFUR

Brian R. James; Chung Li-Lee, both of Vancouver, Canada; Michael A. Lilga, and David A. Nelson, both of Richland, Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Aug. 27, 1986, Ser. No. 900,863

Int. Cl.[4] C01B *17/05*

U.S. Cl. 423—243 **6 Claims**

1. A process for abstracting sulfur and forming hydrogen comprising:

dissolving in a solvent a palladium complex of the formula, $Pd_2X_2(\mu\text{-dppm})_2$,

wherein dppm = bis(diphenylphosphino)methane,

wherein X is selected from Cl, Br, or I,

introducing H_2S to the palladium complex in solution whereby sulfur is abstracted by the complex from the H_2S to form $Pd_2X_2(\mu\text{-S})(\mu\text{-dppm})_2$ and hydrogen.

4,693,876

PROCESS FOR THE PREPARATION OF LINEAR POLYCHLOROPHOSPHAZENE

Roger DeJaeger, Chereng; Guy Pagniez, Lescar, and Philippe Potin, Billere, all of France, assignors to Societe Nationale Elf Aquitaine, Paris, France

PCT No. PCT/FR85/00294, § 371 Date Aug. 14, 1986, § 102(e) Date Aug. 14, 1986, PCT Pub. No. WO86/02344, PCT Pub. Date Apr. 24, 1986

PCT Filed Oct. 15, 1985, Ser. No. 882,958

Claims priority, application France, Oct. 17, 1984, 84 15892

Int. Cl.[4] C01B *25/10*

U.S. Cl. 423—300 **14 Claims**

1. A process for the preparation of linear polychlorophosphazenes having a terminal group $—PXCl_2$, wherein X is oxygen or sulfur, wherein a monomer of the formula P_2NXCl_5 is polycondensed to form a polycondensation mixture by heating to release $PXCl_3$ and said heating is continued after the release of $PXCl_3$ has ceased, wherein at least the heating, following the release of $PXCl_3$, is carried out in solution in a medium which is a solvent of the monomer and the polychlorophosphazene, said solvent being inert to the constituents of the polycondensation reaction.

4,693,877

CLEAVAGE OF FORMAMIDE TO GIVE HYDROCYANIC ACID AND WATER

Ubbo v. Oehsen, Frankenthal; Karlheinz Stecher, Ludwigshafen; Waldemar Koehler, Frankenthal; Berthold Mueller, Bensheim; Fritz Brunnmueller, Limburgerhof, and Rolf Schneider, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 17, 1986, Ser. No. 886,317

Int. Cl.[4] C01C *3/04*

U.S. Cl. 423—373 **2 Claims**

1. A process for the cleavage of formamide to give hydrocyanic acid and water, wherein gaseous, superheated formamide together with from 0.1 to 10% by volume of air is introduced into a tube bundle reactor at from 300° to 480° C., under reduced pressure of from 1 to 350 mbar and passed over moldings subjected to final sintering and consisting of from 50 to 100% by weight of alumina and from 50 to 0% by weight of silica, or over high temperature corrosion-resistant chromium-nickel stainless steel moldings; at from 450° to 590° C., the mean residence time being from 0.01 to 0.25 seconds.

2. A process for the cleavage of formamide to give hydrocyanic acid and water, wherein gaseous, superheated formamide together with from 1.0 to 3.0% by volume of air is introduced into a tube bundle reactor at from 300°–400° C., under reduced pressure of from 50–150 mbar and passed over moldings subjected to final sintering and consisting of from 85–95% by weight of alumina and from 15–5% by weight of silica or over chromium-nickel stainless steel moldings comprising from 18–21% by weight of chromium, from 9–13% by weight of nickel and from 0–3% by weight of silicon, the remainder to 100% by weight being iron; at from 500°–540° C., the mean residence time being from 0.01 to 0.05 seconds.

4,693,878

PROCESS FOR THE PRODUCTION OF SOLUBLE ALKALI SILICATES

Arankathu Skaria, Stäfa, and Heinrich Goeldi, Neuhausen, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Oct. 15, 1986, Ser. No. 919,017

Claims priority, application Switzerland, Jun. 11, 1986, 2365/86

Int. Cl.[4] C01B *33/32*

U.S. Cl. 423—334 **14 Claims**

1. Process for the production of soluble alkali silicates by removal of the fluorine from a finely divided waste silicic acid

reacted with an alkali-containing compound, said silicic acid containing free water and having a BET-surface of less than 20 m^2/g, with a fluorine content of less than 10% in the dry substance, which process comprises:

providing said waste silicic acid occurring by reaction of hexafluorosilicic acid with aluminum hydroxide;

treating said waste silicic acid with agitation with hexafluorosilicic acid heated to 60°–100° C. to form a mixture;

filtering the mixture;

washing the filter cake with water to free the filter cake from remaining hexafluorosilicic acid;

calcined in the range of 600°–1300° C.; and,

reacting with an alkali-containing compound.

7. Process according to claim 1 wherein the purified silicic acid in an above-stoichiometric quantity of 20–25% wt. is brought to reaction at a temperature of 90°–100° C. during 45–60 minutes with a 10–20% wt. alkali hydroxide solution and the hot suspension is filtered off.

4,693,879

ULTRASONIC VIBRATION SIEVING APPARATUS AND PROCESS FOR PURIFYING CARBON BLACK BY USING THE APPARATUS

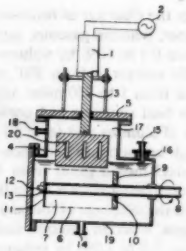
Shushichi Yoshimura; Yasunori Hiwatashi; Hiromu Kobayashi; Hozo Yamazaki, all of Kitakyushu; Nobu Nishino, Iwaki; Teruji Tahara, Yokohama, and Hidenobu Kobayashi, Kitakyushu, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Oct. 9, 1985, Ser. No. 785,680

Claims priority, application Japan, Oct. 9, 1984, 59-212147; Dec. 26, 1984, 59-280578; Dec. 26, 1984, 59-280579

Int. Cl.[4] C09C *1/56*

U.S. Cl. 423—461 **15 Claims**



1. A process for purifying carbon black which contains solid impurities by removing the solid impurities therefrom, which process comprises suspending said carbon black uniformly in water to obtain a carbon black aqueous slurry and subjecting the slurry to a sieving treatment with an ultrasonic vibration sieving apparatus, and wherein said ultrasonic vibration sieving apparatus comprises:

(a) a sieving maching body provided with a supply pipe and a discharge pipe for the carbon black aqueous slurry,

(b) a sieving chamber provided within the sieving machine body and provided with a withdrawal pipe for a sieved carbon black aqueous slurry,

(c) a filter layer constituting a part of the surface of the sieving chamber,

(d) an ultrasonic oscillation tip facing the filter layer surface and being dipped in the carbon black aqueous slurry to be sieved, and

(e) a tip chamber provided above the sieving machine body to permit the ultrasonic oscillation tip to enter into the sieving machine body; and wherein the the tip chamber is a gas chamber filled with a gas except for the lower portion of the ultrasonic oscillation tip.

4,693,880

PROCESS FOR PRODUCING DITHIONITES

Satoshi Arakawa, Chiba, Japan, assignor to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Mar. 5, 1981, Ser. No. 240,830

Claims priority, application Japan, Mar. 6, 1980, 55-28432

The portion of the term of this patent subsequent to Jun. 14, 2000, has been disclaimed.

Int. Cl.[4] C01B *17/66*

U.S. Cl. 423—515 **1 Claim**

1. A process for producing an anhydrous dithionite which comprises reacting at least one formic compound selected from the group consisting of formic acid, formates and mixtures thereof, at least one alkaline compound, and sulfur dioxide in the presence of water and at least one organic solvent, filtering the resulting dithionite crystal from the mother liquor to form a crystal layer, washing the dithionite crystal layer with an organic solvent by adding all of organic solvent used in the washing step in one step and drying the dithionite crystal, the washings from the washing step being discharged in two sequential stages as a first discharge and a subsequent discharge, separately collecting the washings first discharged from the washing step and the washings discharged subsequently, the amount of the washings first discharged is in the range of 20 to 60% by weight based on the weight of the dithionite crystal, distilling the washings first discharged and recovering the organic solvent, and using the washings discharged subsequently without distillation as the reaction solvent.

4,693,881

SIMULTANEOUS SEPARATION AND CONVERSION TO SULFUR OF H_2S

Ralph Miller, Pleasantville, N.Y., assignor to T-Thermal, Inc., Conshohocken, Pa.

Filed Jul. 17, 1985, Ser. No. 755,840

Int. Cl.[4] C01B *17/02*

U.S. Cl. 423—573 R **9 Claims**

1. In a regenerable process for the removal and conversion to sulfur of the hydrogen sulfide contained in a gas in which the gas is contacted with a regenerated, acidic, ferric sulfate-containing reaction medium to react the bulk of the hydrogen sulfide with ferric sulfate to form a slurry of sulfur dispersed in the reaction medium, a mole of ferrous sulfate and a half mole of sulfuric acid being formed in the reaction medium for each half mole of hydrogen sulfide converted to sulfur; the sulfur separated from the reaction medium; the acidic, ferric sulfate-containing reaction medium being regenerated from the ferrous sulfate-containing reaction medium and the regenerated reaction medium recycled to the hydrogen sulfide contacting operation; the improvement which comprises the steps of:

(a) at a low temperature, which temperature is above that sufficient to maintain ferrous sulfate within the medium, continuously contacting the ferrous sulfate-containing reaction medium with a gas containing oxygen and nitric oxide, the ratio of moles of oxygen to moles of nitric oxide in said gas being less than about sixty-one (61) to one (1) to form a regenerated, acidic, ferric sulfate-containing reaction medium and a gas mixture, said gas mixture containing all of the nitric oxide and a diminished oxygen content;

(b) continuously separating said regenerated, acidic ferric sulfate-containing reaction medium from said gas mixture; and

(c) recycling said regenerated, acidic ferric-sulfate-containing reaction medium to the hydrogen sulfide contacting operation;

4,693,882

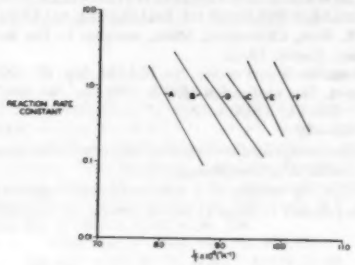
STEAM REFORMING UTILIZING SULFUR TOLERANT CATALYST

Herbert J. Setzer, Ellington; Sam Karavolis, East Hampton, and John A. S. Bett, Hamden, all of Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Division of Ser. No. 857,688, Apr. 30, 1986. This application Dec. 24, 1986, Ser. No. 946,333

Int. Cl.[4] C01B *1/02*

U.S. Cl. 423—652 18 Claims



1. In a steam reforming process for converting hydrocarbon material to hydrogen gas in the presence of sulfur comprising adding steam to the hydrocarbon material and passing the steam and hydrocarbon material over catalyst material at elevated temperatures, wherein the improvement comprises utilizing as a catalyst material high activity, sulfur tolerant catalyst of platinum supported on lanthanum stabilized alumina or magnesium promoted lanthanum stabilized alumina.

7. In a steam process for converting hydrocarbon material to hydrogen gas in the presence of sulfur comprising adding steam to the hydrocarbon material and passing the steam and hydrocarbon material over catalyst material at elevated temperatures wherein the improvement comprises utilizing as a catalyst material high activity, sulfur tolerant catalysts consisting essentially of iridium supported on lanthanum stabilized alumina or magnesium promoted lanthanum stabilized alumina.

13. In a steam reforming process for converting hydrocarbon material to hydrogen gas in the presence of sulfur comprising adding steam to the hydrocarbon material and passing the steam and hydrocarbon material over catalyst material at elevated temperatures wherein the improvement comprises utlilizing as a catalyst material high activity sulfur tolerant catalysts consisting essentially of palladium supported on lanthanum stabilized alumina or magnesium promoted lanthanum stabilized alumina.

4,693,883

AMMONIA UTILIZATION PROCESS

Donald K. Fleming, Park Ridge, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

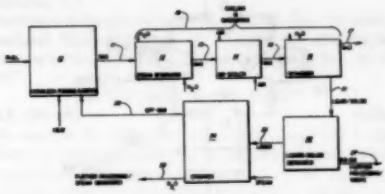
Filed Dec. 27, 1985, Ser. No. 813,919

Int. Cl.[4] C01C *1/02*

U.S. Cl. 423—648 R 18 Claims

1. In a process for gasification of organic carbonaceous materials in a hydrogen forming gasifier, the improvement comprising:

separating ammonia from product gas of said gasifier by dissolving in an aqueous liquid forming sour water; separating said sour water from said gasifier product gas; separating gaseous ammonia from said sour water; and recycling said gaseous ammonia to said hydrogen forming gasifier operated under organic carbonaceous material



gasifying conditions forming a substantial amount of hydrogen and nitrogen from said ammonia.

4,693,884

TECHNETIUM-99M TRIPHOSPHONATES AND TETRAPHOSPHONATES FOR THE SCINTIGRAPHIC VISUALIZATION OF RES-CONTAINING ORGANS AND LYMPH VESSELS, AND A PROCESS FOR THEIR PREPARATION

Hans-Jerg Kleiner, Kronberg/Taunus; Gerhard Kloss, Kelkheim; Michael Molter, Schwalbach; Alexander Schwarz, Flörsheim am Main, and Horst-Dieter Thamm, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 7, 1983, Ser. No. 540,173

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1982, 32375735

Int. Cl.[4] A61K *43/00, 49/00, 49/02*

U.S. Cl. 424—1.1 2 Claims

1. A diagnostic agent for the visualization of RES-containing organs and the lymph vessels, which contains one or more compounds labeled with technetium-99m selected from the group consisting of 2,4,4-triphosphonobutyric acid (TPB), ethane-1,1,2,2-tetraphosphonic acid (ETP), propane-1,1,3,3-tetraphosphonic acid (PTP) and butane-1,1,4,4-tetraphosphonic acid (BTP) or a suitable salt thereof in physiologic saline.

4,693,885

TETRAPYRROLE THERAPEUTIC AGENTS

Jerry C. Bommer, Ogden, and Bruce F. Burnham, Logan, both of Utah, assignors to Nippon Petrochemicals Co., Ltd., Tokyo, Japan

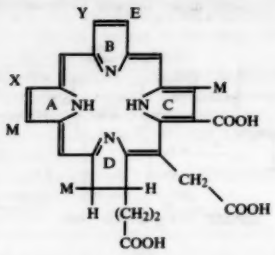
Continuation-in-part of Ser. No. 631,925, Jul. 18, 1984. This application Apr. 30, 1985, Ser. No. 728,784

The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.

Int. Cl.[4] A61K *31/40*; C07D *487/22*

U.S. Cl. 424—2 13 Claims

1. A fluorescent mono, di- or polyamide of an amino acid containing two carboxylic acid groups and a tetrapyrrole compound of the formula:



said amide linkages being formed between the amino group of the amino acid and the carboxyl group of the tetrapyrrole, wherein;

X=H, vinyl, ethyl, acetyl or formyl;

Y=methyl or formyl;

M=methyl; and

E=ethyl

and pharmaceutically-acceptable salts thereof.

12. A method for the detection of mammalian tumors which comprises administering to a mammalian host an effective amount of a compound according to claim **1**; and applying light of sufficient wavelength to the area of the mammalian host to be examined, whereby fluorescence is observed in the tumor-affected area.

13. A method of treatment of mammalian tumors which comprises administering to a mammalian host with a tumor an effective amount of a fluorescent compound according to claim **1**; and applying light of sufficient wavelength and intensity to activate said compound, whereby said activated compound exerts a cell-killing effect on said tumor.

4,693,886

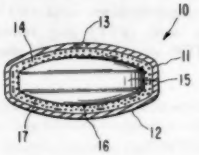
OSMOTIC DEVICE WITH INERT CORE

Atul D. Ayer, Mt. View, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Apr. 22, 1985, Ser. No. 725,840

Int. Cl.[4] A61K *9/22, 9/24, 9/44*

U.S. Cl. 424—15 **11 Claims**



1. An osmotic dispensing device for delivering a beneficial medicine formulation to an environment of use, comprising:

(a) a wall comprising in at least a part a semipermeable composition permeable to the passage of an exterior fluid present in the environment of use and substantially impermeable to the passage of the beneficial medicine formulation, the wall surrounding and forming;

(b) a compartment;

(c) means in the compartment for carrying a beneficial medicine formulation, said means comprising a member selected from the group consisting of a nontoxic, physiologically and pharmacologically inert hydrophobic composition and a nontoxic, physiologically and pharmacologically inert hydrophobic polymer, which means comprises a preshape that corresponds to the interior shape of the osmotic dispensing device thereby providing support for a medicinal formulation;

(d) a dosage unit amount of a medicine formulation carried on the means; and,

(e) at least one passageway in the wall communicating with the compartment for delivering the beneficial medicine formulation from the osmotic device.

4,693,887

MICROPHASE SEPARATED HYDROGELS FOR CONTROLLED RELEASE OF BIOACTIVE MATERIALS

Kishore R. Shah, Chelmsford, Mass., assignor to The Kendall Company, Boston, Mass.

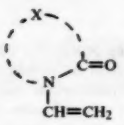
Continuation-in-part of Ser. No. 532,643, Sep. 15, 1983, abandoned. This application May 3, 1984, Ser. No. 606,794

Int. Cl.[4] A61K *9/22, 9/52, 31/78, 31/79*

U.S. Cl. 424—19 **9 Claims**

1. A composition for the controlled and consistent release of a water-soluble drug comprising a blend of:

10 to 30% by weight of a non-crosslinked water-soluble homopolymer of N-vinyl lactam having the structure



in which X represents an alkylene bridge having three to five carbon atoms, or a water-soluble copolymer thereof with 1 to 90 mole percent of copolymerizable monomer containing a polumerizable ethylenic unsaturation;

90 to 70% by weight of a non-crosslinked water-insoluble copolymer comprising from about 50 to 90 percent by weight, based on the total weight of the copolymer, of a hydrophobic water-insoluble ethylenically unsaturated monomer, 2 to 12 percent by weight of an ethylenically unsaturated monomer containing an acid group, and 0 to 50 percent by weight of a hydrophilic ethylenically unsaturated monomer, free from acid groups;

and less than 30% by weight, based on the weight of said blend, of a water-soluble drug dispersed throughout said blend.

4,693,888

CARIES-PREVENTIVE COMPOSITION

Tsuneo Miyahara; Yoshihiro Harada, both of Kanagawa; Katsuyuki Futakami, Chigasaki; Yasukuni Nishida, Kanagawa, and Ryoko Konishi, Ito, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Aug. 7, 1984, Ser. No. 638,553

Claims priority, application Japan, Aug. 11, 1983, 58-146859; Aug. 11, 1983, 58-146858

Int. Cl.[4] A61K *7/16, 7/18, 7/28*

U.S. Cl. 424—49 **27 Claims**

1. A caries-preventive composition, comprising:

an effective amount of antibody obtained by immunizing a mammal with at least one antigen selected from the group consisting of Streptococcus mutans, its cell-wall fraction, it's fibrous substance fraction, it's glucosyltransferase fraction and it's protein antigen fraction; and

an effective amount of at least one synergist selected from the group consisting of fluorine compounds, chlorhexidene and salts thereof, lytic enzymes, bacteriocins, glucosyltransferase inhibitors, proteases and dextranases.

4,693,889

BIRD REPELLENT COMPOSITION

Michael T. Chirchirillo, and Terrance Cannan, both of Chicago, Ill., assignors to Velsicol Chemical Corporation, Rosemont, Ill.

Filed Dec. 9, 1985, Ser. No. 806,877
Int. Cl.[4] A61K *31/745*
U.S. Cl. 424—83 7 Claims

1. A bird repellent composition comprising 15–35 weight percent polyisobutylene having a Staudinger molecular weight of about 8,000 to 15,000, 20–50 weight percent paraffin oil, 0–15 weight percent isoparaffin oil, 0–6 weight percent organic modified montomorillonite and 15–45 weight percent kaolin clay.

4,693,890

USE OF 1-NONEN-3-OL FOR REPELLING INSECTS

Richard A. Wilson, Westfield, N.J.; Jerry F. Butler, Gainesville, Fla.; Donald Withycombe, Lincroft, N.J.; Braja D. Mookherjee, Holmdel, N.J.; Ira Katz, West Long Branch, N.J., and Kenneth R. Schrankel, Tinton Falls, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y. and The University of Florida, Gainesville, Fla.

Filed Jun. 27, 1986, Ser. No. 879,426
Int. Cl.[4] A61K *31/74, 31/745;* A01N *31/00*
U.S. Cl. 424—78 2 Claims

1. A process for repelling house flies, *Musca domestica,* comprising the step of treating an environment infested or imminently capable of being infested with said house flies with a house fly repelling concentration of 1-nonen-3-ol.

4,693,891

VACCINE FOR *PSEUDOMONAS AERUGINOSA*

Michael S. Collins, Richmond; Grace C. Tsay, Walnut Creek, and Richard L. Seng, San Francisco, all of Calif., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Sep. 9, 1985, Ser. No. 773,915
Int. Cl.[4] A61K *39/02*
U.S. Cl. 424—92 17 Claims

1. An immunizing composition effective against gram negative bacteria selected from the group consisting of *Pseudomonas aeruginosa, Escherichia coli,* Proteus sp, Serratia sp, and Klebsiella sp, and free from toxicity and endotoxin activity comprising (a) a non-toxic protein having reactive carboxylic acid groups isolated from the gram-positive bacterium, *Micrococcus luteus;* and (b) a member selected from a non-toxic polysaccharide and a non-toxic lipopolysaccharide isolated from said gram negative bacteria, said non-toxic polysaccharide or non-toxic lipopolysaccharide having been selectively oxidized to provide reactive aldehyde groups thereon, wherein the non-toxic protein and the non-toxic polysaccharide or non-toxic lipopolysaccharide are covalently coupled by means of a polyfunctional compound having a 4–12 carbon atoms and containing at least two functional groups, one of which is reactive to the aldehyde groups on the selectively oxidized non-toxic polysaccharide or non-toxic lipopolysaccharide and the other of which is reactive to the carboxylic acid groups on the non-toxic protein.

4,693,892

GELATIN CONTAINING β-CAROTENE

Ahmed Hegasy, Leverkusen, and Manfred Winter, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 5, 1986, Ser. No. 904,733
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1985, 3532129
Int. Cl.[4] A61K *9/48;* C09B *61/00*
U.S. Cl. 424—456 8 Claims

1. A light-fast opaque coloring composition comprising by weight a mixture of about 1 to 25 parts of β-carotene and about 1 to 25 parts of iron oxide.

4,693,893

VACCINES FOR EQUINE INFLUENZA

David A. Campbell, Palo Alto, Calif., assignor to Burroughs Wellcome, N.C.

Continuation-in-part of Ser. No. 565,648, Dec. 27, 1983, abandoned. This application Apr. 3, 1984, Ser. No. 596,447
Claims priority, application United Kingdom, Jan. 8, 1983, 8300467
Int. Cl.[4] A61K *39/155, 39/295*
U.S. Cl. 424—89 4 Claims

1. A vaccine for either or both of Eq 1 and Eq 2 equine influenza comprising an effective vaccination amount of inactivated genetically reassorted virus grown in cell culture and derived from either or both of an equine Eq 1 and Eq 2 influenza virus and the human influenza virus A/Puerto Rico/8/34 which reassorted virus comprises RNA derived from either or both of Eq 1 and Eq 2 equine influenza virus coding for at least one neuraminidase or haemagglutinin surface antigen and an RNA segment derived from A/Puerto Rico/8/34 which codes for matrix protein in association with a veterinary acceptable carrier which can contain an adjuvant suitable for use as a vehicle to introduce the inactivated virus by parenteral administration into the animal.

4,693,894

HALOPHOR COMPOSITION

Robert H. Juda, Akron; Roger A. Crawford, Wadsworth, both of Ohio, and Paritosh M. Chakrabarti, Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 16, 1986, Ser. No. 819,440
Int. Cl.[4] A61K *33/18*
U.S. Cl. 424—150 34 Claims

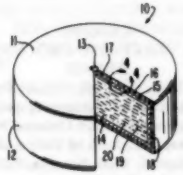
1. A halophor comprising a complex of (a) elemental halogen selected from the group consisting of bromine and iodine, (b) dihalide of poly(ethylene glycol), and (c) added halide represented by the formula MX, wherein M is hydrogen, alkali metal or alkaline earth metal, and X is bromine, chlorine or iodine, the mole ratio of added halide to halogen being from about 1:1 to 1:12, and the amount of elemental halogen in the halophor complex being between about 10 and about 50 weight percent.

4,693,895

COLON DELIVERY SYSTEM

Patrick S. L. Wong, Hayward, and Felix Theeuwes, Los Altos, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Oct. 26, 1984, Ser. No. 665,279
Int. Cl.[4] A61K *27/12, 9/24, 9/36;* A61M *31/00*
U.S. Cl. 424—473 19 Claims



1. An osmotic device for delivering a drug to a biological environment of use, said device comprising:

(a) a shaped laminated wall comprising: (1) a first lamina comprising a semipermeable composition permeable to the passage of fluid and substantially impermeable to the passage of drug; (2) second lamina comprising a composition comprising a polymer and an osmotic solute, which polymer is permeable to the passage of fluid and impermeable to the passage of the osmotic solute; and (3) a third lamina comprising an enteric composition, said first, sec-

ond and third lamina comprising different compositions with the laminated wall surrounding and defining:

(b) a compartment containing a dosage unit amount of a beneficial drug formulation; and,

(c) at least one passageway through the laminated wall communicating with the compartment and the exterior of the osmotic device for dispensing the drug formulation from the device to the environment of use.

4,693,896

ETHYLCELLULOSE-COATED, GASTRIC-DISINTEGRABLE ASPIRIN TABLET

Thomas A. Wheatley, Richboro, Pa., and Rashminkumar S. Shah, East Windsor, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 7, 1985, Ser. No. 785,317
Int. Cl.[4] A61K *9/36*
U.S. Cl. 424—480 **10 Claims**

1. A coated, rapidly-disintegrable analgesic tablet comprising an aspirin tablet core coated with a thin film coating consisting essentially of the dried residue of an aqueous ethylcellulose dispersion that provides a thin film of ethylcellulose polymer containing 10–40 wt % plasticizer based on the film polymer solids, the thin film constituting less than about 2 wt % of the coated tablet weight and consisting essentially of ethylcellulose as the primary coating polymer.

4,693,897

STIMULATION AND ENHANCEMENT OF FEEDING IN HERBIVOROUS FISH

Peter B. Johnsen, Havertown, Pa., and Michael A. Adams, Haddonfield, N.J., assignors to Monell Chemical Senses Center, Philadelphia, Pa.

Continuation of Ser. No. 641,569, Aug. 16, 1984, abandoned. This application Apr. 1, 1986, Ser. No. 846,834
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—2 **2 Claims**

1. A method of production of herbivorous Tilapia or herbivorous grass carp consisting essentially of feeding said Tilapia or said grass carp edible foodstuff admixed with a stimulating or enhancing amount of at least one of glutamic, aspartic or citric acids.

4,693,898

NOVEL BAKER'S YEAST AND PROCESS FOR MAKING BREAD

Yasuo Nakatomi, Chiba; Katsuhiko Hara; Fumio Umeda, both of Saitama; Toshiaki Kono, Kanagawa, and Hisashi Niimoto, Tokyo, all of Japan, assignors to Oriental Yeast Co., Ltd. and Meiji Seika Kaisha, Ltd., both of Tokyo, Japan

Filed Apr. 4, 1986, Ser. No. 848,854
Claims priority, application Japan, Apr. 9, 1985, 60-73580
Int. Cl.[4] C12N *1/18;* A21D *2/00*
U.S. Cl. 426—19 **6 Claims**

1. A process for making bread, which comprises the steps of mixing flour, water, fructooligosaccharide, a strain of yeast called *Saccharomyces cerevisiae* IL-1, FERM P-8056 and a hexose fermentable by said yeast strain, in proportions effective for making bread; leavening said mixture; then baking said leavened mixture to thereby obtain bread in which the fructooligosaccharide has not been decomposed.

6. An essentially pure culture of *Saccharomyces cerevisiae* IL-1, FERM P-8056.

4,693,899

METHOD FOR PREPARING FILLED COOKED DOUGH PRODUCT

Leon Hong, 81 Coalpit Rd., Danbury, Conn. 06810, and John J. Balboni, Nash Rd., Purdys, N.Y. 10578

Filed May 22, 1985, Ser. No. 736,800
Int. Cl.[4] A21D *13/08, 15/02*
U.S. Cl. 426—94 **7 Claims**

1. A method for preparing a filled cooked dough product having a high-moisture filling and an outer casing of bread having a bread-like crust and soft internal crumb, comprising the steps of:

(a) providing a leavened uncooked dough capable of being cooked to a bread-like product having a firm crust and a tender interior crumb;

(b) providing an edible filling comprising a viscous freeze-thaw stable mixture of particulate food ingredients and a water-containing sauce therefor containing a water-binding carbohydrate;

(c) completely enveloping said filling within said uncooked dough;

(d) cooking said enveloped product to an extent sufficient to bring about development in said dough of a firm crust exterior and a tender interior crumb structure;

(e) freezing said cooked product; and

(f) reheating said frozen cooked product to achieve a firm outer crust and a tender non-soggy bread-like crumb in the cooked dough and to achieve a defrosted filling within said cooked dough, both being at a temperature desired for consumption by a method selected from either (1) first subjecting said frozen product to microwave heating and thereafter subjecting said product to non-microwave oven heating or (2) subjecting said frozen product simultaneously to microwave heat and non-microwave oven heating, whereby the microwave heating is sufficient to thaw the filling portion of said product without effecting substantial dehydration thereof and the non-microwave oven heating is sufficient to bring about a crust and crumb structure in said reheated product closely resembling that existing after the cooking of step (d).

4,693,900

SHAPED PASTA PRODUCTS

Claudio Molinari, Collecchio, Italy, assignor to UNIMAC S.r.l., Collecchio, Italy

Filed Aug. 14, 1985, Ser. No. 765,865
Claims priority, application Italy, Sep. 28, 1984, 46866 A/84
Int. Cl.[4] A23L *1/16, 3/10*
U.S. Cl. 426—128 **6 Claims**

1. A shaped pasta product produced by cooking said pasta with water to obtain cooked pasta, placing said cooked pasta in a mold, deaerating under vacuum said cooked pasta in said mold to obtain deaerated cooked pasta, compressing said deaerated cooked pasta under vacuum to obtain compressed cooked pasta, cooling said compressed pasta to obtain a product consisting essentially of cooled compressed cooked pasta, cutting said product into portions, packaging said portions to obtain packaged portions, sterilizing said packaged portions, storing said sterilized packaged portions under vacuum condition to prevent oxidation.

4,693,901

SHELF STABLE DAIRYLIKE PRODUCTS

William Hullah, Don Mills, Canada, assignor to Cardinal Biological, Ltd., Ontario, Canada

Filed Dec. 10, 1985, Ser. No. 807,524
Int. Cl.[4] A23D *5/04*
U.S. Cl. 426—330.6 **3 Claims**

1. A shelf-stable, dairylike product having a dairylike taste and a texture similar to that of sour cream, cream cheese, or fresh cream, comprising from about 5.0 to about 25.0 parts by weight of milk solids, from about 4.0 to about 50.0 parts by

weight of oil, from about 0.2 to about 4.0 parts by weight of emulsifiers, from about 0.003 to about 0.7 parts by weight of a phosphate, and sufficient food grade acid to lower the pH to from about 2.5 to about 4.6, and a stabilizer comprising a combination of from about 0.20 to about 1.5 parts by weight of microcrystalline cellulose and from about 0.01 to about 1.0 parts by weight of carboxylmethyl cellulose, wherein the amount of stabilizer is adjusted to impart the desired texture to the product.

4,693,902

PASTEURIZATION PROCESS

Donald W. Richmond; Carl W. Clyne, and Tod M. Holben, all of St. Louis County, Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Continuation-in-part of Ser. No. 620,471, Jun. 14, 1984, abandoned. This application May 28, 1985, Ser. No. 737,871

Int. Cl.[4] A23L *3/02*; C12H *1/00*

U.S. Cl. 426—407 **16 Claims**

1. An improved method for tunnel pasteurization of beer in packages wherein water spray is applied at a rate of more than about 6 gal./min./ft.^{2} to the tops of the packages of beer from spray nozzles staggered transversely across the width of the tunnel and positioned above the packages to control P.U. input and wherein the P.U. input to each beer package is at a predetermined level between about 5.6 to about 20 comprising,

(a) controlling P.U. input to all packages of beer at a standard deviation of less than about 2 P.U. for each package while providing the P.U. input to each package at a predetermined minimum level above about 5.6,

(b) maintaining cold spot beer temperature in any package between about 140° F. and about 143° F., and

(c) maintaining beer out temperature between about 70° F. and about 85° F.

4,693,903

SESAME SEEDS HUSKING METHOD

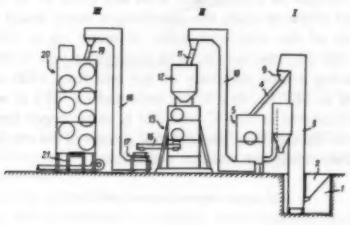
Mohammed Halwani, 90, Av. des Champs-Elysées, 75008 Paris, France

Filed Mar. 9, 1984, Ser. No. 588,127

Claims priority, application France, Oct. 5, 1983, 83 15864

Int. Cl.[4] A23L *1/36*

U.S. Cl. 426—456 **3 Claims**



1. A method for husking sesame seeds and preparing them for the production of oil and consumption, wherein the husking is carried out in two stages wherein:

first, the seeds are introduced to an attrition apparatus while injecting water and a water steam mixture until the water content of said seeds is about 15% and then sieving said seeds at the outlet of said attrition apparatus; and

then, during a second stage, the seeds are introduced into a drying assembly, where at the inlet of said drying assembly they receive a complementary water steam injection bringing their water content between 16% and 18%, the seeds are then dried in an attrition apparatus, thereby loosening the husk debris sticking to the sesame seeds.

4,693,904

PROCESS FOR STERILIZING A COCOA PASTE

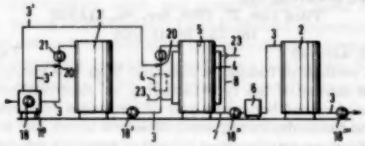
Armin Schmitt, Heusenstamm, Fed. Rep. of Germany, assignor to Luwa AG, Zurich, Fed. Rep. of Germany

Division of Ser. No. 359,783, Mar. 19, 1982, Pat. No. 4,446,781. This application Feb. 2, 1984, Ser. No. 576,175

Claims priority, application European Pat. Off., Mar. 21, 1981, 81102148

Int. Cl.[4] A23G *1/00*

U.S. Cl. 426—521 **4 Claims**



1. In a process for sterilizing a cocoa paste, initially forming the paste into a thin layer, continuously deacidifying said thin-layered paste, partially dehumidifying and degassing said thin-layered paste at a temperature less than 100° C. and, after a hold-up stage during which the paste is subjected to sterilization heat, continuously subjecting said paste in a thin layer to residual demoisturizing, and residual degassing and then discharging said paste for further processing at a rate corresponding to a feed rate at which said paste is initially formed into said thin layer, the improvement comprising, during the hold-up stage, continuously conveying the paste onward, holding up said paste, generating heat in the held-up paste by mechanical mixing to develop a sterilization temperature, maintaining said heat at a mean value by application of external heat, continuously removing a portion of said held-up paste, cooling said removed paste to a temperature below 100° C., with recondensing of a vapor phase, and continuing the treatment of the remaining portion of said held-up paste retained in the hold-up stage.

4,693,905

ORANGE FLAVOR AND AROMA COMPOSITIONS MADE BY DENSE GAS EXTRACTION OF ORGANIC ORGANCE FLAVOR AND AROMA COMPOUNDS

Cornelis H. Japikse; Lester P. Van Brocklin, both of Wyoming; Johnny A. Hembree; Ralph R. Kitts, both of Fairfield, and Donald R. Meece, Norwood, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 19, 1985, Ser. No. 746,608

The portion of the term of this patent subsequent to Mar. 3, 2004, has been disclaimed.

Int. Cl.[4] A23L *2/02*

U.S. Cl. 426—599 **8 Claims**

1. A concentrated orange flavor and aroma composition comprising a natural orange essence oil extract containing organic flavor and aroma compounds, wherein at least three of said compounds are selected from the group consisting of ethyl butyrate, decanal, limonene, and valencene, and wherein at least about 0.50% of the composition is ethyl butyrate, less than about 0.35% of the composition is decanal, at least about 5% of the composition is valencene, and wherein the composition has an ethyl butyrate to limonene ratio of from about 1:10 to about 1:100, and wherein the extract is prepared by a process comprising the steps of:

(a) contacting natural orange essence oil with a solvent gas having a temperature between its critical temperature and about 100° C., and having a reduced pressure between about 0.56 and about 1.31 (where reduced pressure is defined as the extraction pressure of the solvent gas divided by its critical pressure), to extract flavor and aroma

compounds the majority of which have a molecular weight less than or equal to that of limonene;

(b) separating the solvent gas and dissolved compounds from the remaining undissolved compounds; and

(c) separating the dissolved compounds from the solvent gas.

4,693,906

DIELECTRIC FOR ELECTROLUMINESCENT DEVICES, AND METHODS FOR MAKING

Joseph Lindmayer, Rockville, Md., assignor to Quantex Corporation, Rockville, Md.

Filed Dec. 27, 1985, Ser. No. 813,928

Int. Cl.[4] B05D *5/06*

U.S. Cl. 427—69 7 Claims

1. A method of forming a dielectric layer in a electroluminescent device of the type including an electroluminescent layer sandwiched between a pair of electrodes and separated from the electrodes by respective dielectric layers, said method comprising: vapor depositing a layer of tantalum sub-oxide of the form Ta_2O_m, where $4.5 < m < 5.0$; and

exposing the layer of tantalum sub-oxide to OH radicals for completing a stable oxide network of the form $Ta_2O_mOH_{5-m}$.

4,693,907

PROCESS OR NON-ELECTROLYTIC COPPER PLATING FOR PRINTED CIRCUIT BOARD

Takakazu Ishikawa, Oogaki, Japan, assignor to Ibiden Kabushiki Kaisha, Oogaki, Japan

Continuation of Ser. No. 776,083, Sep. 13, 1985, which is a continuation of Ser. No. 562,099, Dec. 16, 1983. This application Jan. 27, 1987, Ser. No. 9,645

Claims priority, application Japan, Dec. 27, 1982, 57-226758

Int. Cl.[4] C23C *18/40*

U.S. Cl. 427—97 7 Claims

1. A process of non-electrolytic copper plating of a printed circuit board with through-holes obtaining a non-electrolytic copper plating film on said board, having mechanical characteristics similar to those of copper electroplating film, said process comprising at least one sequence of the following steps (a)–(f) before desired thickness of copper film deposits on said board:

(a) immersing said printed circuit board to be plated in a single non-electrolytic copper plating bath,

(b) drawing out said printed circuit board from the plating bath,

(c) immersing said printed circuit board in a 1.0–10N of inorganic acid aqueous solution of 20°–40° C. for 1–10 minutes,

(d) drawing out said printed circuit board from the acid aqueous solution,

(e) washing said printed circuit board with water, and

(f) immediately after the washing, immersing said printed circuit board again in the non-electrolytic copper plating bath.

4,693,908

MAGNETIC RECORDING DISK WITH IMPROVED LUBRICANT RETENTION

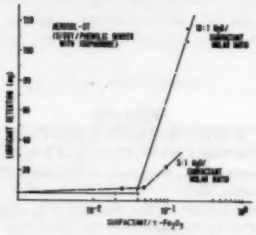
Eva-Maria Rossi, Menlo Park, and Armin R. Tietze, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 19, 1985, Ser. No. 766,623

Int. Cl.[4] G11B *5/708*

U.S. Cl. 427—130 2 Claims

1. In a process for making a magnetic recording disk which includes the steps of providing a suitable disk substrate, preparing an organic-based binder, the binder including a solvent and having magnetic particles dispersed therein, coating the binder onto the substrate, orienting the magnetic particles in alignment with a magnetic field, curing the coating on the substrate and applying a lubricant to the cured coating, an improvement comprising the steps of, before coating on the substrate, adding an inverse micelle forming surfactant to the binder in an amount such that the concentration of surfactant in the binder is sufficient to permit inverse micelles to be formed, and adding water to the surfactant and binder in a predetermined molar



ratio of water to surfactant, whereby during curing on the substrate the water evaporates from the attached inverse micelle forming surfactant and forms micropores in the cured coating for retention of the lubricant.

4,693,909

AQUEOUS WAX DISPERSIONS AS PRESERVATIVES FOR METAL SURFACES AND SURFACES OF COATINGS, THEIR USE AND A PROCESS FOR PRESERVING METAL SURFACES AND SURFACES OF COATINGS

Walter Ziegler, Edingen-Neckarhausen; Wolfram Dietsche, Frankenthal; Stefan Weiss, Neckargemuend; Richard Mueller, Bad Durkheim; Albert Hettche, Hessheim; Klaus Glaser, Mutterstadt, and Christos Vamvakaris, Kallstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 24, 1986, Ser. No. 843,306

Int. Cl.[4] B65B *33/00*; B05D *3/02*

U.S. Cl. 427—156 9 Claims

1. A liquid preservative for metal surfaces and surfaces of coatings, in the form of an aqueous wax dispersion, wherein the said dispersion contains from 10 to 30% by weight of an ethylene/acrylic acid copolymer wax, consisting of from 8 to 25% by weight of acrylic acid units and from 92 to 75% by weight of ethylene units, the percentages being based on the acid form of the wax, and water to make up to 100% by weight, the ethylene/acrylic acid copolymer wax in the acid form having a melt viscosity of not less than 1000 mm2/s, measured at 120° C., as a lower limit and an MFI of not less than 1, measured at 125° C. and 325 g, as an upper limit, and from 50 to 100 mol % of the carboxyl groups of the ethylene/acrylic acid copolymer wax are neutralized.

4,693,910

PROCESS FOR PRODUCING POROUS ANTIREFLECTIVE COATINGS

Sadahiro Nakajima, and Hisayoshi Toratani, both of Tokyo, Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Apr. 17, 1985, Ser. No. 724,319

Claims priority, application Japan, May 7, 1984, 59-89483

Int. Cl.[4] B05D *5/06*

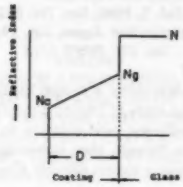
U.S. Cl. 427—168 3 Claims

1. A process for producing optical glass having a porous antireflective coating comprising:

treating an optical glass with an aqueous solution containing:

(i) 0.01 to 1 mol/l of an acidic salt having weak basicity, said acidic salt selected from the group consisting of an

Na_2HAsO_4, Na_2HCO_3, Na_2HPO_4 and NaC_2H_3O and (ii) 0 to 0.01 mol./l of Al^{3+}; and 8.0×10^{-4} to 1×10^{-3} mol./l of Si^{4+}



whereby a porous antireflective coating is obtained on said optical glass, said antireflective coating being substantially scratch-proof at loads in excess of 8.84 grams/cm^2.

4,693,912

LYOPHILIZATION OF REAGENT-COATED PARTICLES

Anthony M. Spadaro, Mahopac; Thomas J. McLoughlin, Ossining, and Phillip V. Engler, Tarrytown, all of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Feb. 28, 1985, Ser. No. 706,495

Int. Cl.[4] B01J *13/02*; G01N *31/00, 33/546*

U.S. Cl. 427—213.3 32 Claims

1. A method of lyophilizing reagent-coated particles, which comprises:

(a) combining a suspension of reagent-coated particles with a cryoprotective agent, said cryoprotective agent forming, during lyophilization of said combined suspension, an inert network encapsulating said particles in spaced-apart non-contacting relationship and also a zwitterionic buffer in an amount sufficient to substantially satisfy any reactive exposed sites on said particles; and

(b) lyophilizing the combined suspension to provide a lyophilized product comprising said encapsulating network and which, upon reconstitution of said lyophilized product and dissolution of the encapsulating network, has a same degree of dispersity as the pre-lyophilized product.

4,693,911

METHOD FOR LINING A BASE WITH A CONTINUOUS GRANULATE LAYER AND EQUIPMENT FOR THE WORKING OF THIS METHOD

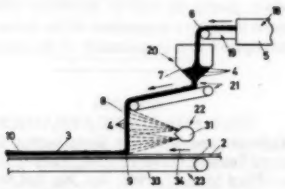
Jean-Frédéric Moreau, Carces, France, assignor to Revetements De Couvin, Couvin, Belgium

Filed Apr. 1, 1986, Ser. No. 846,739

Claims priority, application Belgium, Apr. 3, 1985, PV 0/214780

Int. Cl.[4] B05D *1/02*

U.S. Cl. 427—196 27 Claims



1. Method for lining a substantially plane quadrilateral-shaped surface of a base, with a continuous granulate layer, which comprises:

relieving the granulates from foreign materials,

bringing said granulates to a higher level than the base,

adjusting the granulate flow rate,

spreading the granulates to form said layer,

moving said layer by gravity towards the base such that the layer is received by the base and thereby defines a layer fall location,

coating during the layer fall, those granulates forming said layer with a material which causes said granulates to adhere to the base,

charging the granulates and the coating material oppositely,

moving the layer fall location relative to the base along a direction in parallel relationship with one base side,

adjusting the relative movement speed of said location, and

letting said material coating the granulates laid on the base, harden.

4,693,913

METHOD AND APPARATUS FOR THE LOSS-FREE INTRODUCTION OF BINDING AGENTS INTO MINERAL WOOL FLEECES

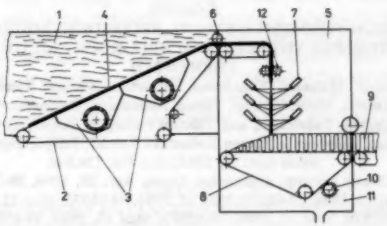
Dieter Gessner, and Rainer Steckert, both of Bad Berka, German Democratic Rep., assignors to VEB Zementkombinat, Dessau, German Democratic Rep.

Filed Apr. 8, 1986, Ser. No. 849,315

Claims priority, application German Democratic Rep., May 6, 1986, 2759904

Int. Cl.[4] B05D *7/00*; C03B *37/04*

U.S. Cl. 427—215 15 Claims



1. A method for the loss-free introduction of binding agents into mineral fiber fleeces comprising,

forming a thin fiber-fleece of mineral fibers not containing any binding agent on a suction belt in a suction chamber;

subsequently conveying the thin fiber fleece into a spraying and collecting chamber completely separated from the suction chamber;

disassociating the thin fiber fleece into individual fibers and fiber agglomerates by means of gravitational force in a free-fall area of the spraying and collecting chamber;

evenly spraying a binding agent onto free-falling individual fibers and fiber agglomerates in the spraying and collecting chamber; and

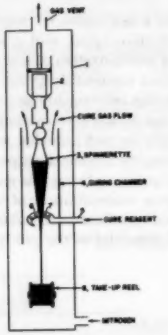
collecting the sprayed, free-falling individual fibers and fiber agglomerates on a collecting belt travelling at a speed necessary to form a crude fiber fleece having a thickness required for further processing.

4,693,914

CURING OF PRECERAMIC ARTICLES WITH GASEOUS THIONYL CHLORIDE

Paul Foley, Oldwick, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed May 5, 1986, Ser. No. 859,952
Int. Cl.[4] C23C 16/00
U.S. Cl. 427—255 4 Claims



1. A process for producing a ceramic material which comprises:

(a) contacting a shaped article made from an organosilicon preceramic polymer with a gaseous thionyl chloride for a period of time sufficient to cure the same; and

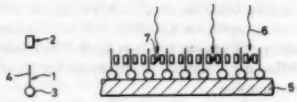
(b) thereafter pyrolyzing said shaped preceramic article by heating the same in an inert atmosphere at elevated temperatures.

4,693,915

FILM FORMING METHOD, RECORDING MEDIUM FORMED THEREBY AND RECORDING METHOD THEREWITH

Hiroshi Matsuda, Yokohama; Masahiro Haruta, Funabashi; Yutaka Hirai, Tokyo; Yukuo Nishimura, Sagamihara; Ken Eguchi, Yokohama, and Takashi Nakagiri, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1985, Ser. No. 724,544
Claims priority, application Japan, Apr. 20, 1984, 59-78636; May 15, 1984, 59-95572; May 15, 1984, 59-95575; May 15, 1984, 59-95576; May 15, 1984, 59-95583; May 15, 1984, 59-95584
Int. Cl.[4] B41M 5/26
U.S. Cl. 427—256 20 Claims



16. A recording method, which comprises selective heating of a recording layer formed of a monomolecular film or a monomolecular-layer built-up film of a clathrate complex compound composed of a host molecule having a hydrophilic portion, a hydrophobic portion and a portion to enclose a guest molecule, and a sublimable guest molecule on a substrate, thereby subliming the guest molecules selectively to make a record.

4,693,916

METHOD OF DEPOSITING A SILICON DIOXIDE FILM

Hirotsugu Nagayama, Nishinomiya; Hisao Honda, Itami, and Hideo Kawahara, Toyonaka, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Jul. 7, 1986, Ser. No. 882,428
Claims priority, application Japan, Jul. 19, 1985, 60-159457
Int. Cl.[4] B05D 1/18
U.S. Cl. 427—397.7 7 Claims

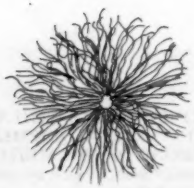
1. A method of depositing a silicon dioxide film on a substrate comprising the steps of adding a metal-containing material to a hydrosilicofluoric acid solution to supersaturate the solution with silicon dioxide, then immersing the substrate in the solution to deposit a silicon dioxide film on the substrate.

4,693,917

PROCESS AND APPARATUS FOR PREPARING A FILLING MATERIAL, PARTICULARLY FOR AN ARTICLE GIVING BODY PROTECTION

Roland A. E. Geloen, 21 rue de Lorraine, 59100 Roubaix, France

Filed Nov. 8, 1985, Ser. No. 796,221
Claims priority, application France, Nov. 9, 1984, 84 17110
Int. Cl.[4] G21C 3/06; D01B 1/48, 3/00
U.S. Cl. 428—6 11 Claims



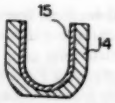
1. Process for the treatment of insulating materials in ths supple, fluffy state, such as down, and intended for filling body-protecting structures, said process comprising the step of subjecting the fluff of the down to a physical treatment adapted to take the filament of the fluff into a substantially radial position, giving the fluff its maximum volume, wherein said treatment includes a suspension of the down fluff in a dry gaseous atmosphere at a temperature of the order of 100° C.

4,693,918

TOOL FOR FIRING CERAMICS

Masashi Fujimoto, and Yoshihisa Kato, both of Kariya, Japan, assignors to Toshiba Ceramics, Ltd., Tokyo, Japan

Filed Mar. 27, 1986, Ser. No. 844,563
Claims priority, application Japan, Aug. 9, 1985, 60-174043
Int. Cl.[4] B32B 1/02; F27B 14/08
U.S. Cl. 428—35 15 Claims



1. A tool for firing ceramics, comprising a ceramic foam body having a three-dimensionally reticulated structure comprising plural interconnected ceramic strands, and a ceramic setting layer formed on at least one part of the surface of the ceramic foam body, wherein each of said ceramic strands comprises plural ceramic layers.

15. A crucible for firing ceramics comprising (a) a ceramic foam body having a three-dimensionally reticulated structure comprising plural interconnected ceramic strands and (b) a

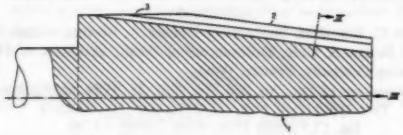
ceramic setting layer formed on at least one surface of the ceramic foam body.

4,693,919

PROTECTIVE DEVICE AND METHOD FOR FORMING PROTECTIVE DEVICE AND USE OF PROTECTIVE DEVICE AS A PACKAGE AND APPARATUS FOR FORMING PROTECTIVE DEVICE

Jean-Paul Languillat, Thorigny-sur-Oreuse; Jean-Michel Morel, Sens, and Jacques Queyrat, Pont sur Yonne, all of France, assignors to Lhomme S.A., Point sur Yonne, France

Filed May 31, 1985, Ser. No. 739,928
Int. Cl.[4] B32B *3/30*; B65B *11/00*; A45C *1/12*; B65D *81/02*
U.S. Cl. 428—36 27 Claims



1. A protective device comprising:

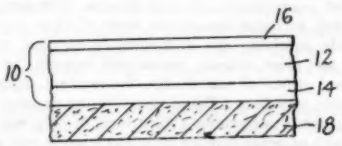
A hollow cardboard body fabricated from a cylindrical cardboard tube to have a surface defining a frustoconical area and a cylindrical area wherein said surface is provided with a series of corrugations including a plurality of ridges and adjacent valleys extending longitudinally along essentially the entire length of surface defining said frustoconical area and coverging towards a point on the longitudinal axis of said body, said corrugations having a depth which increases in the direction of the convergence of said corrugations, so as to provide said frustoconical area of said body with an average diameter which decreases in a substantially progressive manner along the longitudinal axis of said frustoconical area of said body beginning adjacent said cylindrical area.

4,693,920

PRESSURE SENSITIVE COMPOSITE MATERIAL

Arun K. Agarwal, Woodbridge, and Charles Balian, Guilford, both of Conn., assignors to CHR Industries, Inc., New Haven, Conn.

Filed Sep. 3, 1986, Ser. No. 903,300
Int. Cl.[4] A61F *13/02*
U.S. Cl. 428—40 8 Claims



1. A composite material comprising,

a non-woven substrate chosen from the group consisting of polyamide and fiberglass mat,

an adhesive coating applied to the surface of one side of said substrate, said adhesive coating chosen from the group of pressure sensitive adhesives consisting of polyacrylates, polysiloxanes, polyurethanes and resin modified natural and synthetic rubbers such as styrene-butadiene polymers, polyisoprene, polychloroprene, butadiene-acrylonitrile polymers, and

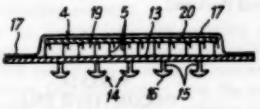
a resin coating applied to the surface of the other side of the substrate, said resin coating chosen from the group consisting of polyacrylates, polyesters, polyurethanes, butadiene-acrylonitrile polymers, and solvent resistant resins such as polychloroprene and chlorosulfonated-polyethylenes.

4,693,921

FASTENING TAPE DESIGNED TO BE ATTACHED TO A MOLDED ARTICLE DURING MOLDING, AND ITS ATTACHING METHOD

Patrick J. Billarant, 7213 Baltusrol La., Charlotte, N.C., and Bruno Queval, 839 Scaleybark Rd., Charlotte, N.C., assignors to Aplix., France

Filed Nov. 30, 1984, Ser. No. 676,951
Claims priority, application France, Dec. 13, 1983, 83 19926; Jun. 26, 1984, 84 10033
Int. Cl.[4] A44B *21/00*
U.S. Cl. 428—100 14 Claims



1. In a fastening member of the type characterized by having a base carrying on one side numerous rows of hook-like projections for mating, releasable engagement with a loose, fibrous non-woven patch to form a fastener assembly, the improvement which comprises a temporary thin protective film covering and sealingly enclosing the hook-like projections around the entire periphery of the fastening member against leakage of molding liquid past the film onto the hook-like projections to protect the hook-like projections from clogging by a molding liquid when molding the fastening member into a molded article and being removable from covering relation to the hook-like projections after the molding liquid has solidified, whereby the hook-like projections are substantially clear of clogging by solidified foam material at the end of the molding process and ready to receive the non-woven patch without an intermediate step of cleaning solidified foam material from the hook-like projections.

4,693,922

LIGHT WEIGHT ENTANGLED NON-WOVEN FABRIC HAVING EXCELLENT MACHINE DIRECTION AND CROSS DIRECTION STRENGTH AND PROCESS FOR MAKING THE SAME

Conrad C. Buyofsky, South River, and John W. Kennette, Somerville, both of N.J., assignors to Chicopee, New Brunswick, N.J.

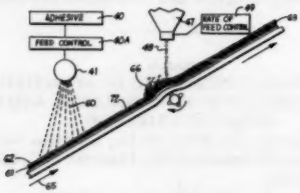
Filed Sep. 26, 1985, Ser. No. 780,461
Int. Cl.[4] B32B *3/10*; D06C *1/46*, *1/74*
U.S. Cl. 428—134 5 Claims

1. An entangled non-woven fabric comprising at least about 75% polyester staple fibers, said fibers being arranged in a repeating pattern of spaced parallel lines of raised entangled regions interconnected by partially entangled fiber arrays, said lines extending in one fabric direction, and spaced bundles of straight substantially parallel fiber segments interconnecting the entangled regions of adjacent lines, said bundles being substantially parallel to one another and substantially perpendicular to said line, adjacent bundle and said lines defining aperatures therebetween.

4,693,923
WATER BARRIER

Bryan M. McGroarty, 10233 Chicago Cir., and Patrick J. McGroarty, 9101 Fifth Ave. South, both of Bloomington, Minn. 55420

Filed Nov. 22, 1985, Ser. No. 801,007
Int. Cl.[4] D06N *7/04;* **E04B** *1/64;* **E04C** *2/26;* **E02D** *19/00*
U.S. Cl. 428—148 **17 Claims**



1. A waterproofing sheet comprising:

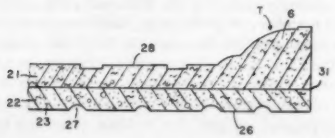
a membrane of water impermeable material; and

a plurality of layers of particles capable of swelling when in contact with water adhered with adhesive membranes to the and to adjacent layers, the layers being formed to a desired thickness.

4,693,924
DECORATIVE TILE

Nina M. Kuper, 2520 N. Gordon Ct., Milwaukee, Wis. 53212, and Janis I. Kalnajs, 724 E. Wells, Milwaukee, Wis. 53202

Continuation-in-part of Ser. No. 701,073, Feb. 13, 1985. This application Aug. 14, 1986, Ser. No. 896,672
Int. Cl.[4] B32B *3/20, 13/02;* **C04B** *31/06, 31/26*
U.S. Cl. 428—170 **18 Claims**



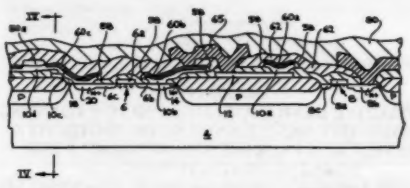
1. A tile comprising a binder having fiber strands and a bulk enhancing agent distributed therein, said tile having a design across a front face thereof and having a density which decreases substantially gradually from front to rear in the direction of the thickness of said tile.

4,693,925
INTEGRATED CIRCUIT STRUCTURE HAVING INTERMEDIATE METAL SILICIDE LAYER

Robin W. Cheung, Cupertino, and Hugo W. K. Chan, Fremont, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 585,340, Mar. 1, 1984, Pat. No. 4,581,815. This application Jan. 24, 1986, Ser. No. 822,352
Int. Cl.[4] B32B *3/22, 15/04*
U.S. Cl. 428—189 **10 Claims**

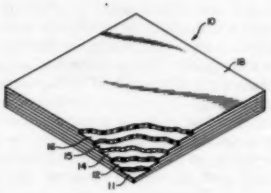
1. An improved integrated circuit structure having enhanced step coverage comprising a base layer of silicon, a first oxide layer on said substrate, a layer of polysilicon thereon doped with a dopant to provide a predetermined resistivity and patterned to provide one or more doped polysilicon strips having selected portions thereof reacted with a metal capable of forming a metal silicide in situ in said polysilicon strips, a further oxide layer over said metal silicide, and a metal layer providing electrical contact to selected portions of said structure, said enhanced step coverage being provided by the elimination of an intermediate metal layer by the formation of said metal silicide in said polysilicon strips.



4,693,926
FLEXIBLE, FIRE-RESISTANT, DECORATIVE LAMINATES AND METHODS OF MANUFACTURE THEREOF

Joseph C. Kowalski, Snohomish; Donald A. Mottaz, Issaquah, and Berton A. Cole, Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 646,570, Aug. 31, 1984, abandoned. This application Nov. 25, 1986, Ser. No. 936,461
Int. Cl.[4] B32B *3/18, 7/02, 15/08, 31/00*
U.S. Cl. 428—204 **48 Claims**



1. A flexible, fire-resistant, decorative laminate comprising, in combination:

a. a flexible panel-like base lamination;

b. a laminar fire-resistant lamination comprising: (i) a first sheet of polyvinyl fluoride adapted to be positioned in face-to-face overlying relation to said flexible panel-like base lamination; and (ii), an aluminum foil sheet overlying said first sheet and bonded thereto;

c. means adhesively bonding said first sheet to said flexible panel-like base lamination;

d. a resinous embossing film overlying and in face-to-face bonded relation to said aluminum foil sheet; and,

e. a laminar decorative sheet overlying and in face-to-face bonded relation to said resinous embossing film, said laminar decorative sheet comprising: (iii) sheet defining means having an outer decorative surface and in face-to-face bonded engagement with said resinous embossing film; and (iv), an outer transparent sheet of clear polyvinyl fluoride overlying and in bonded face-to-face relation with said sheet defining means and forming the outer exposed surface of said flexible, fire-resistant, decorative laminate, said sheet defining means having an outer decorative surace comprising a third sheet of polyvinyl fluoride with an image defining layer and wherein said second sheet of clear polyvinyl fluoride is bonded to, and in face-to-face overlying relation with, said third sheet of polyvinyl fluoride with said image defining layer sandwiched therebetween.

25. The method of forming a composite, flexible, fire-resistant, decorative laminate comprising the steps of:

a. forming a laminar fire-resistant laminate by bonding an

aluminum foil sheet in face-to-face overlying relation to a first sheet of polyvinyl fluoride;

b. adhesively bonding the first sheet of polyvinyl fluoride to a flexible panel-like base lamination;

c. bonding a resinous embossing film to, and in face-to-face overlying relation with, the aluminum foil sheet;

d. bonding sheet defining means having an outer decorative surface to, and in face-to-face overlying relation with, the resinous embossing film; and,

e. bonding an outer transparent second sheet of clear polyvinyl fluoride to, and in face-to-face overlying relation with, the outer decorative surface of the sheet defining means so as to form a transparent, protective, outer exposed surface on the composite, flexible, fire-resistant, decorative laminate; and,

f. said method being further characterized in that the sheet defining means having an outer decorative surface comprises a third sheet of polyvinyl fluoride with an image defining layer and wherein the second sheet of clear polyvinyl fluoride is bonded to, and in face-to-face overlying relation with, the image defining layer sandwiched therebetween.

4,693,927

MAGNETIC RECORDING MEDIUM AND PROCESS FOR PRODUCING THE SAME

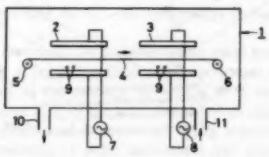
Yasuo Nishikawa; Tsutomu Okita, both of Odawara; Yoshito Mukaida, Ninomiya; Kenji Yanagihara; Mituo Kimura, both of Yokohama, and Masahiro Niinomi, Machida, all of Japan, assignors to Fuji Photo Film Company Limited, Minami-ashigara, Japan

Filed Mar. 15, 1985, Ser. No. 712,095

Claims priority, application Japan, Mar. 19, 1984, 59-53047; Mar. 19, 1984, 59-53048

Int. Cl.[4] G11B *5/72*

U.S. Cl. 428—216 **15 Claims**



1. A magnetic recording medium of improved scratch and weathering resistance, comprising:

a non-magnetic support;

a thin magnetic metal film provided on said support; and

a protective film having high abrasion resistance and an extremely small spacing loss formed on said thin magnetic metal film, said protective film having a thickness which does not exceed 500 Å comprising a plurality of layers formed by plasma polymerization and constituted at least of a base layer of a thickness of from 10–450 Å and having a density of from 0.7 to 1.5 g/cm^3 formed directly on said thin magnetic metal film and a surface layer of a thickness of from 3–450 Å and having a density of not less than 1.2 g/cm^3.

9. A process for producing a magnetic recording medium of improved scratch and weathering resistance comprising a non-magnetic support, a thin magnetic metal film provided on said support and a protective film of a thickness which does not exceed 500 Å which has high abrasion resistance and an extremely small spacing loss formed on said thin magnetic metal film and which consists of a plurality of layers formed by plasma polymerization, which comprises the steps of:

forming a first layer of a thickness of from 10–450 Å on said thin magnetic metal film or on a previously formed layer, by plasma polymerization of a first monomer gas such that the layer has a density of from 0.7 to 1.5 g/cm^3; and

forming a second layer of a thickness of from 3–450 Å on said first layer by plasma polymerization of a second monomer gas, which layer has a density of not less than 1.2 g/cm^3, which second layer is distinguishable from said first layer.

4,693,928

POROUS, FIBROUS STRUCTURES WITH THERMOPLASTIC FLUOROCARBON COATING AND METHOD OF MAKING

Warren M. Foss, Glen Cove, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Feb. 10, 1986, Ser. No. 827,529

Int. Cl.[4] B32B *5/06*

U.S. Cl. 428—236 **21 Claims**

1. A process for making a porous, fibrous structure coated with a fluorocarbon polymer which comprises:

(1) preparing an aqueous slurry of inorganic fibers and thermoplastic fluorocarbon polymer;

(2) precipitating the thermoplastic fluorocarbon polymer onto the inorganic fibers by lowering the pH of the slurry to an acidic value and adding a cationic flocculant;

(3) forming a porous, fibrous structure from the inorganic fibers onto which the fluorocarbon polymer has been precipitated;

(4) drying; and

(5) heating to the melt flow temperature of the thermoplastic fluorocarbon polymer, thereby causing said thermoplastic fluorocarbon polymer to flow and substantially completely coat the inorganic fibers.

4,693,929

MAGNETIC RECORDING MEDIUM

Katsumi Ryoke; Masatoshi Takahashi; Takashi Yoneyama; Yasuo Nishikawa, and Eiichi Tadokoro, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 4, 1985, Ser. No. 784,425

Claims priority, application Japan, Oct. 4, 1984, 59-208483

Int. Cl.[4] G11B *5/70, 5/71*

U.S. Cl. 428—323 **23 Claims**

1. A magnetic recording medium comprising a magnetic layer coated on one side of a non-magnetic support, the magnetic layer comprising ferromagnetic particles dispersed in a binder, with a backing layer coated on the opposite side of the non-magnetic support, wherein the backing layer comprises non-magnetic particles, a binder and silicone which has:

(i) a viscosity of from 1 to 50 CS (centisokes) at 25° C.;

(ii) a refractive index of 1.403 or less at 25° C. and a specific gravity of 0.965 or less at 25° C.; and

which is used in an amount of from 0.01 to 3 wt.% based on the non-magnetic particles;

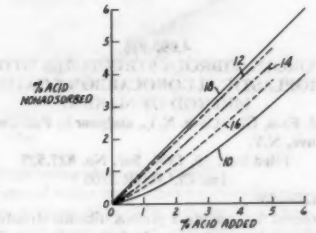
wherein the non-magnetic particles contain carbon black in an amount of at least 50 wt.% based on the total amount of the non-magnetic particles, and wherein 25 wt.% or more of the carbon black has an average particle size of from 150 to 1,000 mμ and wherein the dry thickness of the backing layer is from 1.0 to 5.0 ξm, wherein the amount of said silicone is 3.33 wt.% or less based on the total solid content of the backing layer.

4,693,930

SMOOTH, LOW-FRICTION MAGNETIC RECORDING MEDIUM

Richard J. Kuo, St. Paul; John W. Mackay, Afton, and Rick L. Van Buren, Eagan, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 3, 1985, Ser. No. 730,272
Int. Cl.[4] G11B *5/68, 5/706, 5/71*
U.S. Cl. 428—323 16 Claims



1. Flexible magnetic recording medium comprising a magnetic recording layer having an RMS surface roughness not exceeding 9 nanometers (nm) and comprising a binder in which are dispersed ferromagnetic oxide particles having a surface area of at least 40 m^2/g, said binder containing free monobasic fatty acid in an amount exceeding 1.5 percent by weight of the ferromagnetic oxide particles, but less than an amount that would exude from the recording layer, which fatty acid has a straight chain of at least 12 carbon atoms and provides a coefficient of friction not exceeding 0.3.

4,693,931

MAGNETIC RECORDING MEDIUM AND MAGNETIC PARTICLES THEREFOR

Haruo Andoh, Suita, and Seiji Matsumoto, Sakai, both of Japan, assignors to Hitachi Maxell, Ltd. and Sakai Chemical Industry Co., Ltd., both of Osaka, Japan

Filed Aug. 17, 1984, Ser. No. 641,733
Claims priority, application Japan, Aug. 18, 1983, 58-151116
Int. Cl.[4] B32B *5/16*
U.S. Cl. 428—328 20 Claims

1. A magnetic recording medium comprising a non-magnetic support and a magnetic layer provided thereon, said magnetic layer comprising a binder and a magnetic recording element which comprises acicular gamma-Fe_2O_3 particles having an average porosity of not more than 5% by volume, a specific surface area of 24 to 30 m^2/g and an intensity at the face (210) to that at the face (311) in X ray diffraction of not more than 5%.

4,693,932

ORIENTED POLYESTER FILM

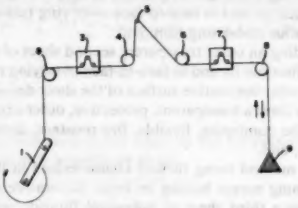
Katsuaki Kuze, Ohtsu; Yasuhiro Nishino, Tsuruga; Yujiro Matsuyama, Ohtsu; Kozo Maeda, Takatsuki; Masahiro Kobayashi, Kyoto; Tadashi Okudaira, Tsuruga; Tsuyoshi Hongo, Ohtsu, and Osamu Makimura, Ogaki, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Continuation of Ser. No. 699,298, Feb. 7, 1985, abandoned. This application May 2, 1986, Ser. No. 858,878
Claims priority, application Japan, Feb. 9, 1984, 59-023567
Int. Cl.[4] G11B *5/708*
U.S. Cl. 428—323 17 Claims

1. An oriented polyester film for manufacturing a magnetic recording tape which comprises a polyester composed of ethylene terephthalate as the major repeating units, and

(I) 0.01 to 1.0% by weight of particles selected from the group consisting of silica particles and titanium dioxide particles having each an average particle size of 0.01 to 0.5μ, and

(II) 0.005 to 1.0% by weight of calcium carbonate particles having an average particle size of 0.01 to 0.5μ, provided



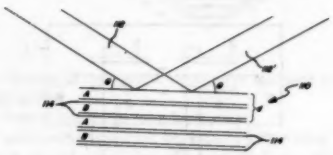
that an amount of particles which have a particle size of not less than 5μ is not more than 0.5% by weight based on the total weight of said particles of (I) and (II) when they are incorporated in a slurry state.

4,693,933

X-RAY DISPERSIVE AND REFLECTIVE STRUCTURES AND METHOD OF MAKING THE STRUCTURES

John E. Keem; Stanford R. Ovshinsky, both of Bloomfield Hills; Steven A. Flessa, Southfield; James L. Wood, Westland; Keith L. Hart, Flat Rock, and Lennard Sztaba, Hamtranck, all of Mich., assignors to Ovonic Synthetic Materials Company, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 501,659, Jun. 6, 1983, abandoned. This application Oct. 31, 1983, Ser. No. 547,338
Int. Cl.[4] B32B *7/02*; G21K *1/06*; G02B *1/00*
U.S. Cl. 428—333 20 Claims



1. An improved X-ray dispersive structure comprising: a plurality of layer pairs formed on one another, said layer pairs having X-ray dispersive properties over a predetermined range of interest, one layer of each of said layer pairs is a non-metallic material chosen from the group consisting of Si, C, B, and B_4C and the second layer of each of said layer pairs is a metallic material, and a buffer layer formed of a material different from the materials forming the first and second layers, chosen from the group consisting of Si, Ge, and SiGe, and having a thickness of 1.3 Angstroms to 5 Angstroms between each metallic and non-metallic layer to provide control of interdiffusion or chemical interaction between said metallic and non-metallic layers.

4,693,934

MAGNETIC RECORDING MEDIUM FOR IMAGE RECORDING

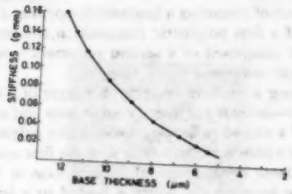
Masaharu Nishimatsu; Hiroyuki Arioka, and Hideki Ishizaki, all of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed May 29, 1985, Ser. No. 738,780
Claims priority, application Japan, Jun. 8, 1984, 59-116595
Int. Cl.[4] G11B *5/64*
U.S. Cl. 428—336 2 Claims

1. A ferromagnetic thin-film for image recording having a

magnetic layer consisting of a ferromagnetic thin film formed on a base film and a backcoat layer formed on an opposite side thereof, said base film having a Young's modulus in the range of from about 280 to 800 kg/cm^2 and a thickness in the range of from 5 to 12 μm, said tape having a stiffness of

$$0.149 \times w e^3/d \times b = 0.02 \text{ to } 0.12 \text{ g-mm}$$



wherein

w: load (g)
a: radius of tape ring (mm)
b: tape width (mm)
d: deformation of tape ring (mm).

4,693,935

POLYSILOXANE-GRAFTED COPOLYMER PRESSURE SENSITIVE ADHESIVE COMPOSITION AND SHEET MATERIALS COATED THEREWITH

Mieczyslaw H. Mazurek, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 19, 1986, Ser. No. 864,517
Int. Cl.[4] C09J *7/02*
U.S. Cl. 428—352 **21 Claims**

1. A pressure sensitive adhesive composition comprising:

(a) a copolymer which has a vinyl polymeric backbone having grafted to it monovalent siloxane polymeric moieties, said copolymer comprising A, C, and, optionally, B monomers wherein:

A is at least one free radically polymerizable vinyl monomer;

B, when used, is at least one reinforcing monomer copolymerizable with A, the amount by weight of B monomer being up to about 20% of the total weight of all monomers in said copolymer, said B monomer being selected from the group consisting of polar monomers and macromers having a T_g or a T_m above about 20° C.; and

C is a polymeric monomer having the general formula

$$X(Y)_nSi(R)_{3-m}Z_m$$

wherein:

The amount and composition of C monomer in the copolymer is such as to provide said pressure sensitive adhesive composition with a decrease in initial peel adhesion value relative to that of an adhesive composition comprising a polymer of A and B, if used, without C and in the same relative amounts of A and B, if used, and of substantially the same molecular weight;

X is a vinyl group copolymerizable with the A and B monomers;

Y is a divalent linking group;

R is a hydrogen, lower alkyl, aryl, or alkoxy;

Z is a monovalent siloxane polymeric moiety having a number average molecular weight of at least about 500 and is essentially unreactive under copolymerization conditions and is pendant from said vinyl polymeric backbone;

n is zero or one;

m is an integer of from one to three

(b) up to about 150 parts by weight compatible tackifying resin per 100 parts copolymer; and

(c) up to about 50 parts by weight of compatible plasticizer per 100 parts copolymer,

said adhesive composition having a peel adhesion value which is lower initially when an exposed surface of said adhesive composition is first applied to a substrate but which builds with time once applied to approach the peel adhesion value of the adhesive composition without C.

4,693,936

LOW COEFFICIENT OF FRICTION MAGNET WIRE ENAMELS

Charles W. McGregor, and Melody L. Sutto, both of Fort Wayne, Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

Continuation of Ser. No. 606,425, May 2, 1984, abandoned. This application Jun. 9, 1986, Ser. No. 873,831
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—383 **5 Claims**

1. An electrical conductor coated with an insulating layer of magnet wire enamel comprising a polyamideimide consisting essentially of the reaction product of a tri-basic anhydride, a diisocyanate and polyfunctional organosiloxane, the polyfunctional organosiloxane being reacted into the polymer backbone prior to application to the electrical conductor, said polyorganosiloxane being present in an amount of about 0.5% to about 5% by weight based on the weight of the enamel, the enamel having a coefficient of friction, after application to magnet wire, of less than 0.10 and the polyfunctional organosiloxane component being substantially non-solvent extractable after application to the wire.

4,693,937

FLAME RETARDANT WIRE WITH HIGH INSULATION RESISTANCE

Alexander F. Wu, Bridgeport, Conn., and Robert B. Walters, Morrison, Colo., assignors to General Electric Company, Bridgeport, Conn.

Division of Ser. No. 578,729, Feb. 9, 1984, abandoned. This application Jul. 22, 1985, Ser. No. 703,065
Int. Cl.[4] B32B *15/04*; H01B *3/00*
U.S. Cl. 428—389 **5 Claims**

1. The method of forming a cable which comprises; preparing a blend of flame retardant ingredients by weight as follows:

INGREDIENTS	RANGE
Decabromodiphenyl oxide	100
Antimony oxide	10–70
Fumed silica	5–30
Reactive silicone fluid	0.1–10

overnizing the flame retardant ingredient blend; adding the ovenized blend to additional ingredients by weight as follows:

INGREDIENTS	RANGE
Polyolefin	100
Bromine containing treated flame retardant	5–80
Dibasic lead phthalate	0–20
Silicone gum	0–20
Lead stearate	0–3
Octamethyltetracyclosiloxane	0–5
Triallyl cyanurate	0–5
Zinc salt of a mercaptoimidazole	0.5–15
Sterically hindered di-tertiary butyl phenol	0.5–15

and disposing the resultant composition in an insulating layer on a wire.

4,693,938

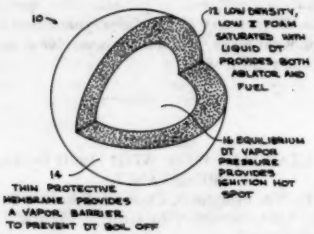
FOAM SHELL CRYOGENIC ICF TARGET

Dale H. Darling, Pleasanton, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 7, 1986, Ser. No. 927,995

Int. Cl.[4] G21B *1/00*; A61N *5/12*; B32B *5/18, 9/00*

U.S. Cl. 428—403 **10 Claims**


10
12 LOW DENSITY, LOW Z FOAM SATURATED WITH LIQUID DT PROVIDES BOTH ABLATOR AND FUEL
16 EQUILIBRIUM DT VAPOR PRESSURE PROVIDES IGNITION HOT SPOT
14
THIN PROTECTIVE MEMBRANE PROVIDES A VAPOR BARRIER TO PREVENT DT BOIL OFF

1. An inertial confinement fusion target comprising a hollow spherical shell of low density, low Z, open cell, rigid foam saturated with liquid DT.

4,693,939

ARTICLE COATED WITH COPOLYMER OF POLY(VINYL ALCOHOL)

Ronald F. Ofstead, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 731,915, May 8, 1985, Pat. No. 4,618,649, which is a continuation-in-part of Ser. No. 500,785, Jun. 3, 1983, Pat. No. 4,528,325. This application Sep. 3, 1986, Ser. No. 891,852

Int. Cl.[4] B32B *27/00*

U.S. Cl. 428—421 **12 Claims**

1. An article having a coating comprising a non-crosslinked poly(vinyl alcohol) copolymer which is the reaction product of:

a. a non-crosslinked poly(vinyl trifluoroacetate) copolymer having a molecular weight in the range of 200,000 to 4,000,000 which is the reaction product of:

1. 95 to 99.99 weight percent of vinyl trifluoroacetate monomer, and

2. 0.01 to 5 weight percent of a comonomer selected from vinyl esters, vinyl ethers, and copolymerizable disubstituted ethylenes; and

b. a mild base in a non-aqueous diluent selected so that the poly(vinyl trifluoroacetate) copolymer and its poly(vinyl alcohol) copolymer solvolysis product are insoluble therein.

4,693,940

LAMINATE AND METHOD OF PREPARING SAME

Christine E. Vogdes, Albany, and Yutaka Kawazoye, Los Altos, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 466,266, Feb. 14, 1983, abandoned. This application Mar. 30, 1984, Ser. No. 595,072

Int. Cl.[4] B32B *27/16*

U.S. Cl. 428—422 **16 Claims**

1. A method of preparing a laminate comprising a first layer composed of a first polymeric composition and an adherent second layer composed of a second polymeric composition, which method comprises

(1) preparing a laminate comprising a layer of a first radiation cross-linkable polymeric composition and an adjacent layer of a second radiation cross-linkable polymeric composition which is incompatible with the first composition, the laminate being prepared by a process in which the interface between the layers is heated to a temperature which is higher than the melting point of at least one of the polymers in at least one of the compositions; and

(2) irradiating the laminate prepared in step (1) to effect cross-linking of said first and second compositions.

4,693,941

REINFORCED POLY(ETHYLENE TEREPHTHALATE) COMPOSITIONS

George J. Ostapchenko, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 390,684, Jun. 21, 1982, abandoned, which is a continuation-in-part of Ser. No. 223,024, Jan. 6, 1981, abandoned. This application Aug. 6, 1985, Ser. No. 762,874

Int. Cl.[4] B32B *27/06*; B29C *43/02*; C08L *67/02*; C08K *7/14*

U.S. Cl. 428—480 **16 Claims**

1. A process for thermoforming an article from a sheet of a composition having a crystallinity of 0–5% and consisting essentially of the following components in stated approximate weight proportions:

(a) 60–77% of poly(ethylene terephthalate) having an inherent viscosity of more than 0.55 dL/g;

(b) 3–10% of at least one terpolymer of ethylene selected from the class consisting of ethylene/methacrylic acid-/isobutyl acrylate terpolymer, ethylene/methacrylic acid/n-butyl acrylate terpolymer, and ethylene/vinyl acetate/methacrylic acid terpolymer, the respective proportions of methacrylic acid and of isobutyl acrylate, n-butyl acrylate, or vinyl acetate in the terpolymer being about 1 to 30 weight percent of each;

said terpolymer having 0–100% of its carboxylic groups converted to their salt form, the cation being a divalent metal ion;

with the first proviso that up to about 20% of the recited component (a) can be replaced by a polymer compatible with poly(ethylene terephthalate) and selected from the class consisting of polyesters, polyamides, and polycarbonates; and

(c) 20–30% of a reinforcing material having an aspect ratio of at least 10%;

with a second proviso that the composition does not contain nucleating agents;

the process comprising the following steps:

(A) placing the sheet in a single mold maintained at a temperature of about 140°–150° C.,

(B) applying a vacuum of about 8 kPa to one side of the sheet, while a pressure of about 690–5520 kPa is applied to the other side of the sheet, to cause the sheet to deform and collapse onto the mold, thus conforming its shape to that of the mold,

(C) releasing the vacuum and the pressure, and

(D) removing the resulting molded article from the mold.

4,693,942

APEX SEAL FOR ROTARY PISTON ENGINES

Tsutomu Shimizu, Higashi-Hiroshima; Jun Miyata, and Koji Yagii, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jan. 7, 1986, Ser. No. 816,834
Claims priority, application Japan, Jan. 14, 1985, 60-4610
Int. Cl.[4] B32B *15/00*; F01C *21/08*
U.S. Cl. 428—614 2 Claims

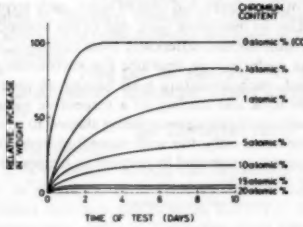
1. An apex seal for rotary piston engines comprising a substrate of an iron-based material having a sliding surface portion having a thickness of 1.5 to 3.5 mm, said sliding surface portion being formed by dispersing a Co-Mo-Si intermetallic compound into an iron-based material to produce a matrix of Co-Mo-Si-Fe alloy formed by Fe content in the iron-based material which is molten when the Co-Mo-Si intermetallic compound is dispersed in the iron-based material and the Co-Mo-Si intermetallic compound dispersed in the matrix in an amount of 25 to 60 vol. %, said matrix containing less than 25 weight % of Fe.

4,693,943

MAGNETOOPTICAL RECORDING MEDIUM

Hiroyoshi Kishi, Tokyo, and Masaaki Matsushima, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 491,300, May 1, 1983, abandoned, and Ser. No. 492,634, May 9, 1983, abandoned. This application Nov. 16, 1984, Ser. No. 671,978
Claims priority, application Japan, May 10, 1982, 57-77677; May 17, 1982, 57-82653; Mar. 16, 1983, 58-45035
Int. Cl.[4] G11B *7/24*
U.S. Cl. 428—678 5 Claims



1. A magnetooptical recording medium which comprises an amorphous magnetic alloy film having an axis of easy magnetization in a direction perpendicular to the film surface, said alloy having a composition represented by the general formula IV as follows:

$$[(Gd_{1-z}Tb_z)_{1-y}(Fe_{1-x}Co_x)_y]_{1-p}Cr_p \quad (IV)$$

wherein $0<z<1$; $0.005 \leqq x<1$; $0.5 \leqq y \leqq 0.9$ and $0.001 \leqq p \leqq 0.3$.

4,693,944

SURFACE-COATED WEAR-RESISTANT MEMBER OF CERMET AND PROCESS FOR PRODUCING SAME

Taijiro Sugisawa, and Akio Nishiyama, both of Yokohama, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 661,193, Oct. 15, 1984, abandoned. This application Sep. 23, 1986, Ser. No. 910,834
Claims priority, application Japan, Oct. 21, 1983, 58-197217
Int. Cl.[4] B32B *15/04*
U.S. Cl. 428—698 7 Claims

1. A surface-coated wear-resistant member of cermet comprising:

(a) a substrate of cermet; and

(b) a hard coating vapor-deposited on a surface of said substrate, said coating composed of at least one titanium compound selected from the group consisting of titanium carbide, titanium nitride, carbo-nitride of titanium, oxy-carbide of titanium, oxy-nitride of titanium and oxy-carbo-nitride of titanium, the atomic ratio of one of carbon, nitrogen, carbon plus nitrogen, carbon plus oxygen, nitrogen plus oxygen and carbon plus nitrogen plus oxygen to titanium (Ti) in said titanium compound being in the range of between 0.3 and 0.8, said titanium compound comprising TiX and Ti_2X wherein X is one of carbon and nitrogen or at least two of carbon, nitrogen and oxygen,

said TiX having a cubic structure, said Ti_2X having a tetragonal structure and

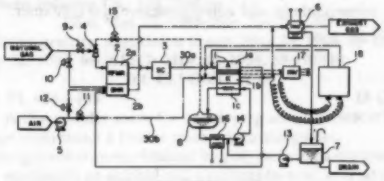
said titanium compound having an average thickness of 1 to 10 μm.

4,693,945

POWER GENERATOR CONTAINING FUEL CELL

Hideo Ohyauchi; Yoshiaki Amano, both of Ibaraki, and Eiji Yokoyama, Kashiwa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 22, 1986, Ser. No. 854,503
Claims priority, application Japan, Apr. 22, 1985, 60-84487
Int. Cl.[4] H01M *8/06*
U.S. Cl. 429—21 7 Claims



1. A fuel-cell power generator comprising hydrogen and oxygen feed lines, a fuel cell which generates DC power as the cell receives hydrogen gas and oxygen gas from said feed lines, and fuel supply means which supplies hydrogen gas to said hydrogen feed line and oxygen gas to said oxygen feed line in response to a sharp rise of power load connected to said fuel cell; said fuel supply means including means for producing hydrogen gas and oxygen gas by electrolyzing an electrolyte by DC power generated by said fuel cell and for supplying the produced gases to said hydrogen and oxygen feed lines connected to said fuel cell; said means for producing hydrogen gas and oxygen gas comprising a tank containing pressurized electrolyte, hydrogen and oxygen electrodes disposed in said tank and connected to the DC power source of said fuel cell, cylindrical gas reservoirs for storing the gases produced from said oxygen electrode and said hydrogen electrode, respectively, and piping means for connecting said cylindrical gas reservoir to said hydrogen and oxygen feed lines via valves.

4,693,946

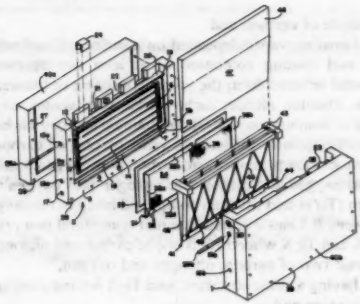
BATTERY WITH MODULAR AIR CATHODE AND ANODE CAGE

Marilyn J. Niksa, Painesville; Gerald R. Pohto; Leslie K. Lakatos, both of Mentor; Douglas J. Wheeler, Cleveland Heights, all of Ohio; Andrew J. Niksa, Painesville; Thomas J. Schue, Huntsburg, both of Ohio, assignors to ELTECH Systems Corporation, Boca Raton, Fla.

Filed Mar. 11, 1986, Ser. No. 838,484

Int. Cl.[4] H01M 2/10

U.S. Cl. 429—27 **6 Claims**



1. A battery of the consumable metal anode type adapted for ready assembly as well as disassembly, said battery comprising:

a non-conductive cell container resistant to cell electrolyte;

a unitized framed gas-diffusion cathode with porous sheet cathode member, foraminous metal conductor member impressed against said sheet cathode member, and conductive metal frame positioned around the peripheral edges of said sheet cathode member and conductor member,

an anode cage in the cell container and having cage frame members at least in part compressed against the frame of said cathode,

with said anode cage and unitized frame cathode being independently removable upon compression release and reinsertable in said non-conductive cell container.

4,693,947

SYSTEM FOR AGITATING THE ACID IN A LEAD-ACID BATTERY

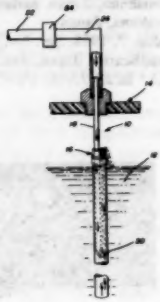
Alvin Weintraub, Schenectady, and Robert S. MacCormack, Glenville, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 21, 1986, Ser. No. 854,363

Int. Cl.[4] H01M 2/38

U.S. Cl. 429—51 **5 Claims**

1. The method of agitating acid in a lead-acid battery which comprises the steps of passing compressed air through a humidifier, delivering said compressed humidified air to an air-lift



in a battery cell containing acid and bubbling said air up through said air-lift to agitate said acid.

4,693,948

ELECTRIC STORAGE BATTERY

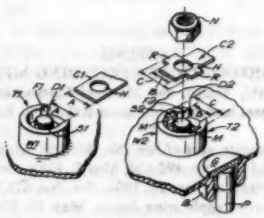
Keith J. B. McEwan, Solihull, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Dec. 20, 1985, Ser. No. 811,438

Claims priority, application United Kingdom, Dec. 20, 1984, 8432260

Int. Cl.[4] H01M 2/26, 2/00

U.S. Cl. 429—121 **22 Claims**



1. An electric storage battery comprising a casing having a pair of terminals extending therefrom for connection to respective connectors, the terminals each having a free end and being located on a wall of the battery and spaced apart, each terminal being surrounded by an insulating wall, one of the connectors being shaped and dimensioned differently from the other, each of the connectors including an aperture for surrounding its respective terminal, each insulating wall having an aperture extending therethrough and leading to a respective passageway within the wall, each passageway being shaped to receive the respective connector only, the wall extending beyond the free end of the respective terminal to prevent an element e.g. a tool, bridging the terminals.

4,693,949

STORAGE BATTERY HOUSING

James H. Kellett; Raymond W. Gaddis, both of Winston-Salem; Robert W. Fritts, Thomasville, all of N.C., and David L. Schoenecker, Anaheim, Calif., assignors to Douglas Battery Manufacturing Co., Winston-Salem, N.C.

Filed Aug. 12, 1985, Ser. No. 764,385

Int. Cl.[4] H01M 2/02, 2/04

U.S. Cl. 429—178 **7 Claims**

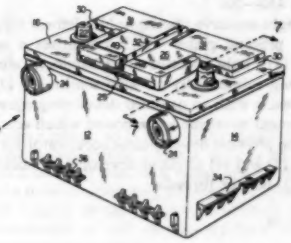
1. A universal battery container or housing for storage batteries of the type used in automobiles, boats, and the like, and

in which a plurality of horizontally spaced, lead plates are contained and electrically connected through the battery container to exterior terminals, said container comprising:

(a) side walls, end walls, a top wall, and a bottom wall forming said container and in which said plates are arranged;

(b) a first set of positive and negative exterior terminal posts on said top wall and a second set of positive and negative exterior terminal posts on one of said side walls so arranged that said first and second sets are selectively electrically connected to said plates;

(c) said top wall including, in addition to said terminal posts, a handle support pad raised or upstanding from the surface thereof in the area of said top wall intermediate said terminal posts, said handle support pad including means associated therewith for pivotally attaching a handle thereto,



the marginal area of said top surface being free of any upstanding structure around the periphery thereof, thereby adapting the battery container to be clamped down by a peripheral frametype clamp;

(d) said handle support pad including a recessed groove therethrough for the receipt of a looped securing member therethrough which extends up alongside said side walls and across said top wall from side wall to side wall;

(e) each of said side walls and each of said end walls include an outwardly protruding ledge member adjacent the bottom wall, said ledge being of such size and configuration as to be selectively securely engaged by lower hold down clips or brackets which engage in some cases the ledges of the lower end walls and in some cases the ledges of the lower side walls and are provided as the battery securing device by some automobiles and boats.

4,693,950

SECONDARY LITHIUM CELL

Rafail V. Moshtev; Vesselin G. Manev, and Bogdana L. Puresheva, all of Sofia, Bulgaria, assignors to Zlehit pri Ban, Sofia, Bulgaria

Filed Oct. 30, 1985, Ser. No. 792,901

Claims priority, application United Kingdom, Oct. 30, 1984, 67349

Int. Cl.[4] H01M *10/40*

U.S. Cl. 429—194 **4 Claims**

1. A secondary lithium cell comprising an anode of lithium or its alloys, an electrolyte solution containing an ionizable lithium salt in a non-aqueous solvent in the liquid, solid or molten state, and a cathode of an alkali thiochromite, wherein part of the chromium of said thiochromite is substituted with another transition metal, vanadium, said substituted alkali thiochromate having the following general formula

$$Na_yCr_{1-x}V_xS_2,$$

with

x being a numerical value from 0.1 to 0.2, and

y being equal to 1 for a stoichiometric compound, and a value from 0.1 to 0.3 for a non-stoichiometric compound.

4,693,951

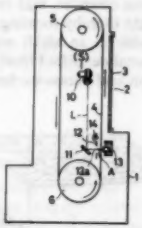
IMAGE FORMING METHOD AND IMAGE BEARING MEMBER

Yoshio Takasu, Tama; Yoshihiro Oguchi, and Kazuharu Katagiri, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 1, 1984, Ser. No. 616,279

Int. Cl.[4] G03G *13/22, 13/24*

U.S. Cl. 430—31 **7 Claims**



1. An image forming method using an image bearing member having a photoconductive layer and having a maximum surface roughness of 20 μm or less and an average surface roughness satisfying a relation of $r \leqq 2d$; wherein r is an average surface roughness of the surface, and d is a mean particle size of the toner particle, and having (i) a contact angle with water of at least 70 degrees, and (ii) a pencil hardness of at least F as measured according to the JIS test method K-5400, which comprises a repetitive cycle of steps comprising exposing an optical image on an image bearing member from the side of the substrate, and forming a toner image on the front surface of the image bearing member corresponding to the portion where said optical image exposure is applied.

4,693,952

TONER FOR DEVELOPING ELECTROSTATIC LATENT IMAGE

Fumio Koizumi, Hachioji; Takahira Kasuya, Hino, and Jiro Takahashi, Sagamihara, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo

Filed May 22, 1985, Ser. No. 736,705

Claims priority, application Japan, May 22, 1984, 59-101815; May 22, 1984, 59-101817; May 22, 1984, 59-101818

Int. Cl.[4] G03G *9/08*

U.S. Cl. 430—109 **13 Claims**

1. A dry powder toner for developing an electrostatic latent image comprising a binder resin which comprises

(a) a polyester resin obtained by polymerizing a composition containing an alcohol and a carboxylic acid, at least one of said alcohol and said carboxylic acid being a multifunctional component having at least three valence bonds and

(b) an epoxy resin in an amount of from 40% to 80% by weight relative to the whole binder resin.

4,693,953

METHOD FOR PRODUCTION OF MOISTURE SENSITIVE ELEMENT

Eiichi Torikai, Yao, Japan, assignor to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Mar. 28, 1986, Ser. No. 845,510

Claims priority, application Japan, May 17, 1985, 60-106729

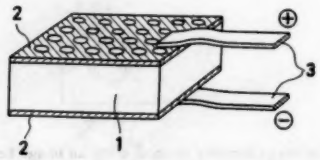
Int. Cl.[4] G03C *1/52, 5/00*; B01D *59/40*

U.S. Cl. 430—165 **8 Claims**

1. A method for the production of a moisture sensitive element possessing on the surface thereof an electrode layer and a moisture-adsorbing portion, comprising the steps of:

(a) applying on a portion of a surface of a perfluorosulfonate

cation-exchange membrane a resist ink which comprises a prepolymer resin selected from the group consisting of epoxy acrylate, alkyd acrylate, polyester acrylate, polyol acrylate, polyether acrylate, oligoacrylate and polyurethane acrylate or a cut monomer selected from the group consisting of monoacrylates, diacrylates and a triacrylate selected from the group consisting of 1,6-hexanediol monoacrylate, cyclohexyl acrylate, 1,6-hexanediol acrylate, neopentyl glycol diacrylate, trimethylol propane triacrylate and pentaerythritol triacrylate, a photoinitiator and at least one extender, said resist ink being curable by ultraviolet light thereby forming a cured surface material which is soluble in an alkali and which is incapable of having any metal deposited thereon when metal is chemically plated on said cation-exchange membrane;



(b) irradiating the surface of said cation-exchange membrane coated with said resist ink with ultraviolet light in a patterned fashion thereby selectively curing the applied layer of said resist ink;

(c) chemically plating the surface of said cation-exchange membrane which has been irradiated thereby forming an electrode layer on the portion of said surface which does not have cured resist ink thereon; and

(d) treating the surface of said cation-exchange membrane with an aqueous alkali solution thereby removing said cured resist ink therefrom and exposing the underlying surface of the cation-exchange membrane which forms the moisture adsorbing portion of said membrane.

4,693,954

HEAT DEVELOPABLE LIGHT-SENSITIVE MATERIALS WITH HIGH BOILING POINT SOLVENTS AND BASE OR BASE PRECURSORS

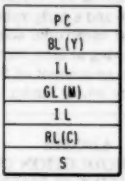
Hideki Naito, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 27, 1985, Ser. No. 781,077

Claims priority, application Japan, Sep. 27, 1984, 59-202265

Int. Cl.[4] G03C *5/54, 1/40, 7/26*

U.S. Cl. 430—203 **11 Claims**



1. A heat-developable light-sensitive material comprising a support having thereon (1) a light-sensitive element containing at least one light-sensitive silver halide emulsion layer and at least one image forming substance capable of forming a diffusible dye, and (2) a dye fixing element, provided on the same side of said support, wherein said dye fixing element contains at least one of a base or base precursor plus a dispersion of a high boiling point solvent, wherein said dye fixing element comprises at least one light-reflective layer and at least one dye fixing layer, said white reflective layer containing at least one of said base or said base precursor and said dispersion of high boiling point solvent.

4,693,955

NEGATIVE TYPE LITHOGRAPHIC PRINTING PLATE

Koichi Torizuka, and Kiyoshi Futaki, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Mar. 18, 1985, Ser. No. 712,731

Claims priority, application Japan, Mar. 19, 1984, 59-54089; Jan. 28, 1985, 60-15039

Int. Cl.[4] G03C *5/54, 1/06*

U.S. Cl. 430—204 **19 Claims**

1. A light-sensitive photographic element for negative lithographic printing plates which comprises a support having thereon (1) a light-sensitive silver halide, (2) a metal salt particle having substantially no light-sensitivity, (3) a compound which reacts with an oxidized developing agent produced by development to release a compound which acts as a solvent or a solution physical development accelerator for said metal salt particle (2) and (4) physical development nuclei, which compound (3) has the formula:

$$A—B \qquad [I]$$

wherein A represents a redox release carrier moiety which is oxidized by cross-oxidation with the oxidized developing agent and releases residue B by the subsequent hydrolysis under alkaline condition and B represents a substituent which produces a compound having dissolving action or solution physical development acceleration action for the metal salt particle upon being released from A.

4,693,956

PROCESS FOR HIGH CONTRAST DEVELOPMENT OF PHOTOGRAPHIC ELEMENTS

Carlo Marchesano, Savona, Italy, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 15, 1985, Ser. No. 798,751

Claims priority, application Italy, Nov. 16, 1984, 23619 A/84

Int. Cl.[4] G03C *5/24, 1/06, 1/00, 5/30*

U.S. Cl. 430—264 **41 Claims**

1. A process for forming a high-contrast photographic image by developing a silver halide photographic element, including at least a silver halide emulsion layer, with an aqueous alkaline developing solution containing a dihydroxybenzene developing agent, a superadditive developing agent and an antioxidant at a pH of less than 12 in the presence of a hydrazine compound, an organic antifogging and contrast promoting agent selected within the class including a benzotriazole compound and a benzimidazole compound and a hydroxymethylidyne group containing compound of the formula:

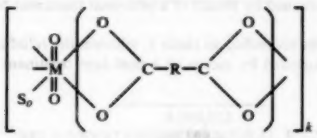
wherein R_1 and R_2 each independently represent a hydrogen atom, an aliphatic group, an aromatic group, a heterocyclic group, or R_1 and R_2 together complete a non aromatic cyclic group.

4,693,957
TRANSITION AND INNER TRANSITION METAL CHELATE POLYMERS FOR HIGH ENERGY RESIST LITHOGRAPHY

Ronald D. Archer, Amherst; Christopher J. Hardiman, Belchertown; Ryszard Grybos, and James C. W. Chien, both of Amherst, all of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 14, 1985, Ser. No. 711,786
Int. Cl.[4] G03C 5/00; C08G 79/00
U.S. Cl. 430—269 9 Claims

1. Transition and inner transition chelate polymer resists for lithographic procedures having the formula:



where k is a positive integer so as to have the number average molecular weight of said chelate polymer to be at least 5,000, M is the transition or inner transition metal ion, S_o represents one molecule of a polar coordinating solvent, R is a member of a functionalized organic group to provide scission or cross linking upon irradiation of said chelate polymer, and each dashed line represents half a bond.

4,693,958
LITHOGRAPHIC PLATES AND PRODUCTION PROCESS THEREFOR

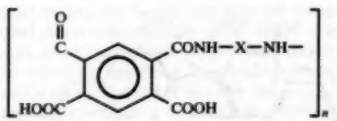
Anthony M. Schwartz, Rockville, Md.; Norimichi Kawashima, Yokohama, Japan, and Albert C. Zettlemoyer, Bethlehem, Pa., assignors to Lehigh University, Bethlehem, Pa.

Filed Jan. 28, 1985, Ser. No. 695,259
Int. Cl.[4] G03F 7/02; G03C 5/16
U.S. Cl. 430—302 4 Claims

1. A process for the production of lithographic plates comprising the steps of:

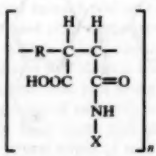
(a) spreading over a rigid substrate a layer of a coating polymer selected from the group consisting of:

(i)



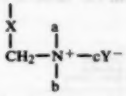
wherein X is aliphatic, aromatic, or aralkyl of a type which permits the polyimide resulting from ring-closure to be preferentially ink-receptive, and the polymer before ring-closure to be water or dilute aqueous alkaline-soluble;

(ii)



wherein X is aliphatic, aromatic, alkyl substituted aromatic, chlorine substituted aromatic, alkoxy substituted aromatic, alicyclic, or aralykyl hydrocarbon residue from 1 to 20 C atoms wherein R is the residue of a comonomer selected from the group of 2 to 12 C atom olefins, 4 to 6 atom 1–4 dienes, styrene, or hydrocarbon or halogen substituted styrenes, vinyl ethers, or vinyl halides;

(iii) polymers or copolymers of the vinyl or acrylic type containing mer units bearing a pendant group



wherein
X is alkyl or aryl
Y is an anion,
a, b, c are alkyl, aralkyl or a and
b form a morpholine ring with the nitrogen
in sufficient proportion to make the polymer water soluble or highly water-swellable and non-adherent to said substrate when in the water-swollen state;

(iv) copolymers of a vinyl or acrylic monomer, whose homopolymer is water-insoluble and ink preferring, with vinylpyrrolidone in such proportion that the copolymer contains sufficient pyrrolidone residues to make it water-swellable and non-adherent to said substrate when water-swollen;

said coating polymer being hydrophilic and being curable to a hydrophobic state,

(b) exposing said coated substrate to a source of infrared radiation in a predetermined pattern to cause said polymer coating to convert said polymer coating to a hydrophobic, ink-receptive state, in which its aqueous contact angle is greater than 55 degrees, and

(c) Removing unexposed portions of said polymer coating by washing said plate with water or a neutral or alkaline aqueous solution.

4,693,959
ADHESION PROMOTION IN PHOTORESIST LAMINATION AND PROCESSING

Robert W. Ashcraft, Towanda, Pa., assignor to E.I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 7, 1986, Ser. No. 837,389
Int. Cl.[4] G03C 5/00
U.S. Cl. 430—323 11 Claims

1. In a process for forming a photoresist on a substrate comprising the steps of:

(a) laminating to the substrate a supported solid photosensitive film layer which is photopolymerizable of photocrosslinkable,

(b) imagewise exposing the layer to actinic radiation,

(c) removing unexposed areas of the layer to form resist areas,

(d) permanently modifying areas of the substrate which are unprotected by the resist areas by etching the substrate or by depositing a material onto the substrate, and

(e) removing the resist areas from the substrate,

the photosensitive layer comprising:

(1) polymerizable or crosslinkable ethylenically unsaturated compound, and

(2) radiation sensitive, free radical generating photoinitiator or photoinitiator system,

wherein the improvement comrprises the photosensitive layer containing an additive to increase adhesion to a substrate which is a condensation polymer formed from a triazine, formaldehyde and toluene sulfonamide or hydantoin, formaldehyde and toluene sulfonamide.

4,693,960

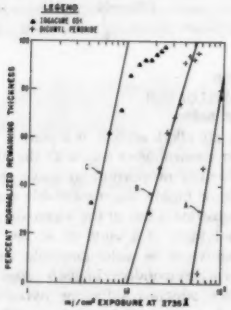
PHOTOLITHOGRAPHIC ETCHING PROCESS USING ORGANOSILICON POLYMER COMPOSITION

Edward D. Babich, Ridgefield, Conn.; Michael Hatzakis, Chappaqua, N.Y.; John J. Liutkis, Yorktown Heights, N.Y.; Juri R. Paraszczak, Pleasantville, N.Y., and Jane M. Shaw, Ridgefield, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 717,987, Mar. 29, 1985, abandoned. This application Nov. 7, 1986, Ser. No. 928,680

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—323 **10 Claims**



1. A process for producing an image which comprises providing on a substrate a layer of an ultraviolet light-sensitive negative resist composition consisting essentially of:

(a) polysiloxane having polymerizable ethylenically unsaturated groups wherein said polysiloxane contains about 0.1% to about 20% by weight of ethylenically unsaturated groups per molecule and wherein said polysiloxane also contains phenyl or substituted phenyl groups, and

(b) 2,2-dimethoxy-2-phenyl acetophenone in an amount sufficient to improve the sensitivity to ultraviolet light radiation, and being at least about 0.1% by weight based upon the polysiloxane.

imagewise exposing the layer of light-sensitive composition to imaging ultraviolet radiation in a desired pattern and developing the exposed layer, thereby leaving the desired pattern of the layer of light-sensitive negative resist composition remaining on the substrate, and then etching the substrate by a dry etching process using the pattern of the layer of light-sensitive negative resist composition as the mask.

4,693,961

PHOTOPOLYMERIZABLE COATING AGENT, A PHOTOPOLYMERIZABLE MATERIAL AND ITS USE

Sigrid Bauer, Paudex, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 691,713, Jan. 14, 1985, Pat. No. 4,601,973, which is a continuation-in-part of Ser. No. 503,445, Jun. 13, 1983, abandoned. This application Apr. 10, 1986, Ser. No. 849,994

Claims priority, application Switzerland, Jun. 24, 1982, 3885-82

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—325 **11 Claims**

1. A process for preparing a relief image on a support material which comprises

exposing a material which has been coated with a layer of a photopolymerizable coating agent which comprises

(a) at least one uncured epoxy resin based on a bisphenol or a novolac and epichlorohydrin, and having an epoxide value of 0.2 to 0.5 equivalents per kg of resin and an average molecular weight of 1,000 to 10,000,

(b) at least one uncured epoxy resin based on a bisphenol or a novolac and epichlorohydrin, and having an average molecular weight of 20,000 to 60,000, the weight ratio of a:b being from 8:1 to 3:1,

(c) at least one light-sensitive, polyethylenically unsaturated monomer having terminal ethylene groups, and

(d) at least one photoinitiator or at least one sensitizer or a mixture of at least one photoinitiator and at least one sensitizer, through a photomask, and then

removing the unexposed areas by means of a developer.

7. A process according to claim 1 wherein the coating agent additionally contains a hardener for the epoxy resins selected from the group consisting of dicyandiamide, polybasic carboxylic acids, anhydrides of polybasic carboxylic acids and mixtures of the said hardeners with mono-, di- or triethanolamine, alone or together with a hardening accelerator.

10. A process according to claim 1 wherein the relief image obtained is hardened by means of a post-heat treatment before development.

11. A process according to claim 1, wherein the relief image obtained is hardened by means of a post-heat treatment after development.

4,693,962

PHOTOCHROMIC PHOTOSENSITIVE COMPOSITIONS

Shinichiro Tamura, and Junetsu Seto, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

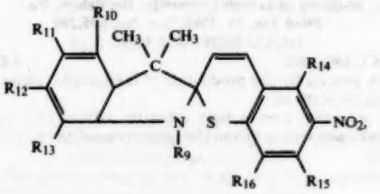
Filed Dec. 9, 1985, Ser. No. 807,017

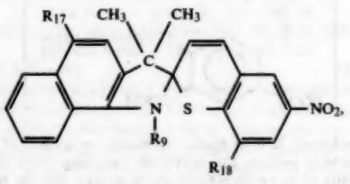
Claims priority, application Japan, Dec. 10, 1984, 59-260411

Int. Cl.[4] G03C *1/733*

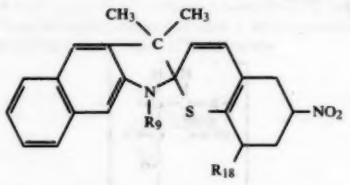
U.S. Cl. 430—345 **6 Claims**

1. A photochromic photosensitive composition comprising a photochromic spiropyran compound, a high molecular weight, optically transparent film forming a polymer, and a compound for stablizing said spiropyran compound in its colored state, said photochromic spirochromic compound being represented by one of the following general formulas:





or



wherein R_9 represents an alkyl group containing 1 to 20 carbon atoms, R_{10}, R_{11}, R_{12}, and R_{13} each represents a hydrogen atom, an alkyl group containing 1 to 5 carbon atoms, an alkoxy

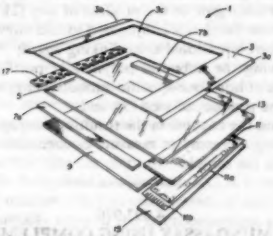
group containing 1 to 5 carbon atoms, a halogen atom, a nitro group or dimethyl amino group, R_{14}, R_{15}, and R_{16} each represents a hydrogen atom, an alkyl group containing 1 to 5 carbon atoms or a halogen atom, R_{17} and R_{18} each repesents a hydrogen atom, an alkyl group containing 1 to 5 carbon atoms, an alkoxy group containing 1 to 5 carbon atoms, an alkoxyalkyl group containing 2 to 10 carbon atoms, a halogen atom, a nitro group or a cyano group, and said compound for stabilizing is selected from the group consisting of: 3,3'-dihydroxyphenyl amine and 4,4'-bis(4-hydroxy-phenyl)sulfone.

4,693,963

SELF-DEVELOPING INTEGRAL FILM UNIT

Thomas P. McCole, South Natick, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 1, 1986, Ser. No. 846,614
Int. Cl.[4] G03C *3/00*
U.S. Cl. 430—499 **5 Claims**



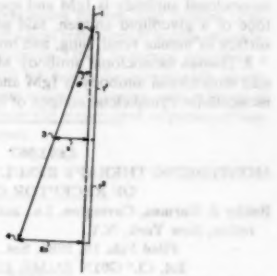
1. A photographic film unit adapted to be exposed and then processed to form a visible image in an area thereof by moving said film unit relative to and between pressure applying members to distribute a processing composition within said film unit toward the trailing end thereof, said film unit comprising first and second sheets of substantially equal widths, at least one of said sheets comprising photosensitive constituents; a rupturable pod releasably containing a processing composition and positioned at the leading end of said film unit so as to discharge said processing composition for distribution between said first and second sheets; a trap for receiving excess processing composition, said trap being positioned at the opposite, trailing end of said film unit from said pod; a mask adhered to the outer surface of said first sheet, said mask having an aperture therein defining an image area, said mask extending over and around the leading edge of said film unit adjacent said pod and over and around the trailing edge of said film unit adjacent said trap; a spacer element slightly wider than said pod and positioned over but not bonded to said pod and extending beyond the rupturable edge of said pod, said spacer element being laminated to the inner surface of said mask, or to the inner surface of said first sheet if said first sheet is laminated to said mask in the area over said pod, said pod being attached to said mask only by the leading edge of said pod, whereby said pod is free to move toward or away from said spacer element; rails extending along the lateral edges of said film unit to determine the thickness of the distributed processing fluid, said rails being positioned between said sheets and laminated to said sheets and to said spacer element.

4,693,964

MULTICOLOR PHOTOGRAPHIC ELEMENT WITH A TABULAR GRAIN EMULSION LAYER OVERLYING A MINUS BLUE RECORDING EMULSION LAYER

Richard L. Daubendiek, Rochester; Gary L. House, Victor, and Timothy R. Gersey, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 790,692, Oct. 23, 1985, abandoned. This application Aug. 1, 1986, Ser. No. 891,803
Int. Cl.[4] G03C *1/40, 7/26*
U.S. Cl. 430—505 **10 Claims**



1. A photographic element for producing multicolor dye images comprised of

a support, and, coated on said support,

superimposed dye image providing layer units comprised of

at least one blue recording yellow dye image providing layer unit and

at least two minus blue recording layer units including a green recording magenta dye image providing layer unit and a red recording cyan dye image providing layer unit,

one of said layer units being positioned to receive imagewise exposing radiation prior to at least one of said minus blue recording layer units and containing a tabular grain emulsion comprised of a dispersing medium and silver bromide or bromoiodide grains having a mean diameter in the range of from 0.4 to 0.55 μm including tabular grains having an average aspect ratio of greater than 8:1 accounting for at least 50 percent of the total projected area of said grains in said emulsion layer.

4,693,965

METHOD FOR MANUFACTURING A SILVER HALIDE EMULSION

Mikio Ihama, and Tadaaki Tani, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 27, 1985, Ser. No. 802,285
Claims priority, application Japan, Dec. 3, 1984, 59-255477
Int. Cl.[4] G03C *1/18, 1/08*
U.S. Cl. 430—569 **30 Claims**

1. A method for manufacturing a chemically and spectrally sensitized silver halide emulsion, which comprises carrying out chemical ripening of the emulsion in the presence of an iridium salt and 0.01 to 10 mmol per mol of the silver halide of a photographic carbocyanine spectral sensitizing dye which forms J-aggregates.

4,693,966

HUMAN MONOCLONAL ANTIBODIES FROM LYMPHOCYTES OF PATIENTS WITH MALIGNANT MELANOMA

Alan N. Houghton; Hannah Brooks; Richard J. Cote, all of New York; Herbert F. Oettgen, New Canaan, Conn., and Lloyd J. Old, New York, N.Y., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Filed Mar. 11, 1983, Ser. No. 474,618

Int. Cl.[4] G01N *33/577;* **C12N** *5/00;* **C07K** *15/04*

U.S. Cl. 435—7 **7 Claims**

1. Human monoclonal antibody Ma4 (HB8222), wherein said monoclonal antibody is IgM and specifically binds to an epitope of a glycolipid antigen, said antigen found on the cell surface of human renal, lung, and breast cancer cells.

3. Human monoclonal antibody M307 (HB 8235), wherein said monoclonal antibody is IgM and specifically binds to an intracellular cytoskeletal antigen of human cells.

4,693,967

MONITORING THERAPY RESULTS IN BODY SAMPLES OF RECEPTOR CELLS

Bobby J. Gormus, Covington, La., assignor to Research Corporation, New York, N.Y.

Filed Feb. 18, 1981, Ser. No. 235,510

Int. Cl.[4] G01N *33/533, 33/534, 33/554*

U.S. Cl. 435—7 **5 Claims**

1. A method for differentially diagnosing between human leukemia and lymphoma disorders involving leucocytes that possess at least three membrane receptors per leucocyte for one or more molecules selected from the group consisting of an activated third component of complement (C3), immunoglobulin G, and immunoglobulin M, which comprises:

(a) reacting a sample of a patient's blood containing leucocytes with particles coated with said molecules to form a complex;

(b) incubating the complex under receptor cap forming conditions;

(c) enumerating the percentage of leucocytes in said sample capable of forming receptor caps and

(d) comparing said percentages to normals.

4,693,968

AGENT FOR QUANTITATIVE DETERMINATION OF MICROORGANISMS

Tsunehiro Kitagawa, Nagasaki, Japan, assignor to Dainippon Pharmaceutical Co., Ltd., Japan

Filed Aug. 22, 1984, Ser. No. 643,281

Claims priority, application Japan, Aug. 24, 1983, 58-155602

Int. Cl.[4] G01N *53/00, 33/541;* **C12Q** *1/02, 1/04*

U.S. Cl. 435—7 **3 Claims**

3. A method for the quantitative determination of a group of strains belonging to same species of microorganism based on non-competitive antigen-antibody reaction, which comprises the following six steps:

step (i) adding a first antibody raised against a first strain which belongs to the species of the microorganism to be determined, the antibody having affinity for more than one strain of the species, to a test sample suspected of containing the microorganism to be determined, in order to subject them to non-competitive antigen-antibody reaction, wherein the amount of the first antibody added is predetermined and excessive as compared to the amount of the microorganism to be determined, and allowing the first antibody to react with microorganisms in the test sample;

step (ii) adding insolubilized cell walls of a second strain belonging to the species of microorganism to be determined, the second strain having a low affinity to to the first antibody in step (i) in comparison with the first strain, to the reaction mixture of step (i), an allowing the cell walls to react with the remaining free first antibody which has not been bound with the microorganisms to be determined, to form a cell walls-antibody precipitate;

step (iii) separating the precipitated cell walls-antibody complex formed in step (ii);

step (iv) adding a labelled second antibody having affinity for the first antibody to the complex in order to form cell walls-antibody-labelled second antibody complex;

step (v) washing the complex formed in step (iv); and then,

step (vi) measuring the activity of labelling substance in the complex.

4,693,969

REAGENT FOR USE IN A SANDWICH SOLID-PHASE ENZYME-IMMUNOASSAY AND PROCESS FOR EMPLOYING SAME

Brij B. Saxena, Englewood, and Premila Rathnam, Englewood Cliffs, both of N.J., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed May 4, 1984, Ser. No. 607,025

Int. Cl.[4] G01N *33/535, 33/545, 33/74;* **C12N** *9/96*

U.S. Cl. 435—7 **9 Claims**

1. A "sandwich" enzyme-immunossay for measuring hormone concentration in a sample, comprising the steps of:

(1) immobilizing on a substrate, an antibody specific to a hormone to be assayed;

(2) incubating the immobilized hormone specific antibody with the sample to be assayed;

(3) adding a reagent comprising a purified polymer of a purified γ-globulin fraction of hormone-specific antibody: enzyme conjugate to the product of step (2), wherein said γ-globulin fraction is conjugated to said enzyme by means of a heterobifuntional cross-linking agent;

(4) removing the unbound polymer of purified γ-globulin fraction of hormone-specific antibody: enzyme conjugate, from the product of step (3); and

(5) assaying the enzyme in the resulting conjugate of step (4) and using the assay to measure concentration of the hormone in the sample.

4,693,970

IMMUNOASSAY USING COMPLEMENT

James P. O'Connell, Chapel Hill; Randal A. Hoke, Carrboro, and Patrick D. Mize, Durham, all of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jun. 21, 1985, Ser. No. 747,497

Int. Cl.[4] G01N *33/53, 33/536, 33/543;* **C12Q** *1/44*

U.S. Cl. 435—7 **15 Claims**

1. A method for determining the concentration of an analyte in a fluid comprising:

(a) contacting an analyte in a fluid with an antianalyte, a substrate selected from the group consisting of a chromogen and a fluorogen and the first component of complement;

(b) causing said analyte to bind to said antianalyte whereby said first component is activated to modulate said substrate and provide a detectable signal;

(c) measuring said detectable signal; and

(d) determining the concentration of said analyte in said fluid by comparing the magnitude of said signal with the magnitude of a signal established for a known quantity of said analyte.

4,693,971

HIGHLY SENSITIVE ENZYME ASSAY METHOD

Hideo Misaki, Shizuoka, Japan, assignor to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Jan. 30, 1984, Ser. No. 575,292

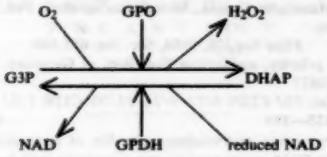
Claims priority, application Japan, Jan. 28, 1983, 58-13057

Int. Cl.[4] C12Q *1/50, 1/44, 1/26, 1/32*

U.S. Cl. 435—17 **12 Claims**

1. A quantitative assay method for a component selected from the group consisting of L-glycero-3-phosphate (G3P),

dihydroxyacetone-3-phosphate (DHAP), nicotinamide adenine dinucleotide (NAD) and reduced NAD, in a specimen to be assayed, comprising causing a component in the specimen to take part in the reaction



wherein GPO is glycerophosphate oxidase and GPDH is glycerophosphate dehydrogenase, and measuring a detectable change in the amount of a consumed or generated component of the reaction system.

4,693,972

COMPOSITION AND METHOD FOR RAPID DETECTION OF MICROORGANISMS IN CLINICAL SAMPLES

James D. Mansour, Raleigh; Thomas H. Schulte, Cary, and Vernon R. Neece, Durham, all of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jan. 16, 1984, Ser. No. 571,001

Int. Cl.[4] C12Q *1/04, 1/44, 1/02, 1/06;* **G07K** *3/00;* **G01N** *21/64*

U.S. Cl. 435—34 **18 Claims**

1. A method for the detection of microorganisms in a body fluid sample comprising mixing said body fluid sample with an enzyme in a buffer whereby components of said body fluid but substantially none of the microorganisms in said sample are lysed, staining said microorganisms with ethidium bromide and determining the presence of said microorganisms by detecting the fluorescence emitted by said ethidium bromide.

18. A method for the detection of microorganisms in a body fluid sample comprising the steps of:

(a) mixing the body fluid sample with 5XLA lysing agent to provide a mixture wherein components of said body fluid but substantially none of the microorganisms are lysed;

(b) incubating said mixture;

(c) adding a staining buffer and ethidium bromide to said mixture; and

(d) flowing said mixture through a fluorescence activated flow cytometer and detecting the fluorescence associated with the microorganisms in said mixture.

4,693,973

DNA SEQUENCES, RECOMBINANT DNA MOLECULES AND PROCESSES FOR PRODUCING BOVINE GROWTH HORMONE-LIKE POLYPEPTIDES IN HIGH YIELD

Gary N. Buell, Geneva, Switzerland, assignor to Biogen N.V., Curacao, Netherlands Antilles

Filed Aug. 11, 1983, Ser. No. 522,357

Claims priority, application United Kingdom, Aug. 17, 1982, 8223695

Int. Cl.[4] C12P *21/00;* **C12N** *15/00*

U.S. Cl. 435—68 **6 Claims**

1. A process for increasing the yield of a bovine growth hormone-like polypeptide to at least 100 times that of a bovine growth hormone-like polypeptide encoded by a DNA sequence of the formula:

ATGGCCTTCCCAGCCATGTCCTTGTCCGGC
CTGTTTGCCAACGCTGTGCTCCGGG
CTCAGCACCTGCACCAGCTGGCTGCTGAC
ACCTTCAAAGAGTTTGAGCGCACCTACATC
CCGGAGGGACAGAGATACTCCATCCAGAACA
CCCAGGTTGCCTTCTGCTTCTCTGAAAC
CATCCCGGCCCCCACGGGCAAGAATGAGG
CCCAGCAGAAATCAGACTTGGAGCTGCTTC

-continued

GCATCTCACTGCTCCTCATCCAGTCGTGG
CTTGGGCCCCTGCAGTTTCTCAGCAGAGTC
TTCACCAACAGCTTGGTGTTTGGCACCTC
GGACCGTGTCTATGAGAAGCTGAAGGACCT
GGAGGAAGGCATCTTGGCCCTGATGCGGGA
GGTGGAAGATGGCACCCCCCGGGCTGGGC
AGATCCTCAAGCAGACCTATGACAAATTTG
ACACAAACATGCGCAGTGACGACGCGCTG
CTCAAGAACTACGGTCTGCTCTCCTGCTTC
CGGAAGGACCTGCATAAGACGGAGACGTA
CCTGAGGGTCATGAAGTGCCGCCGCTTCGG
GGAGGCCAGCTGTGCCTTC

in the same vector-host expression system, said process comprising the step of culturing a host transformed with a recombinant DNA molecule comprising DNA sequence encoding a Met Δ or Δ bovine growth hormone-like polypeptide operatively linked to an expression control sequence, said Δ being an amino terminal deletion from the amino acid sequence of mature bovine growth hormone.

4,693,974

PROCESSES FOR PRODUCING LEUCROSE

Dieter Schwengers, Dormagen, and Herta Benecke, Frechen-Grefrath, both of Fed. Rep. of Germany, assignors to Pfeifer & Langen, Cologne, Fed. Rep. of Germany

Division of Ser. No. 809,714, Dec. 17, 1985. This application Sep. 29, 1986, Ser. No. 913,268

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1984, 3446380

Int. Cl.[4] C12P *19/18;* **A23G** *3/00;* **A23L** *1/236*

U.S. Cl. 435—97 **2 Claims**

1. A process for producing leucrose having a purity of at least 50% by weight, characterized in that saccharose is reacted with α-(1–6)-glucosyl transferase in the presence of at least 100 mmoles of fructose per 1,000 I.U. of enzyme, and the dextrans and iso-malto-oligosaccharides are at least partially separated.

4,693,975

HUMAN HYBRIDROMA FUSION PARTNER FOR PRODUCTION OF HUMAN MONOCLONAL ANTIBODIES

Danuta Kozbor, and Carlo M. Croce, both of Philadelphia, Pa., assignors to The Wistar Institute, Philadelphia, Pa.

Filed Nov. 20, 1984, Ser. No. 673,370

Int. Cl.[4] C12N *15/00, 5/00;* **C12R** *1/91*

U.S. Cl. 435—172.2 **12 Claims**

1. A stable, continuous human somatic cell hybrid cell line produced by fusing a mutant cell obtained from one of either the human plasmacytoma cell line RPMI 8226 or the human lymphoblastoid cell line GM 1500 with a cell obtained from the other of either the RPMI 8226 cell line or the GM-1500 cell line, to produce a first hybrid cell line, said mutant cell exhibiting a first selectable phenotype capable of being complemented and a second selectable phenotype capable of being transmitted upon fusion with said other cell, and then mutating a cell of said first hybrid cell line to obtain said human somatic cell hybrid cell line exhibiting a selectable phenotype that can be complemented upon fusion with an antibody producing cell and having the ability to form a stable continuous cell line upon fusion with an antibody producing cell.

4,693,976

PROCESS FOR THE INCORPORATION OF FOREIGN DNA INTO THE GENOME OF DICOTYLEDONOUS PLANTS USING STABLE COINTEGRATE PLASMIDS

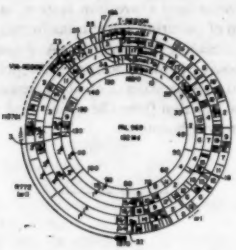
Robbert A. Schilperoort, Anthonie Duycklaan 10c, 2334 CD Leiden, and Jacques Hille, Reymerweg 76, 6871 HG Renkum, both of Netherlands

Filed Feb. 23, 1984, Ser. No. 583,024

Claims priority, application Netherlands, Feb. 24, 1983, 8300699

Int. Cl.[4] C12P *21/00, 21/02;* C12N *1/22, 1/00*

U.S. Cl. 435—172.3 3 Claims



1. A process for the incorporation of foreign DNA into the genome of dicotyledonous plants comprising infecting the plants or incubating plant protoplasts with *Agrobacterium tumefaciens* bacteria, which contain one or more Ti (tumour inducing) plasmids, characterized in that as Ti plasmid a stable cointegrate plasmid composed of the plasmid R772 and the plasmid pTiB6 with foreign DNA incorporated in the T-region of the Ti component of the cointegrate plasmid is applied.

4,693,977

ENZYME IMMOBILIZATION FOR PRODUCING CEPHALOSPORIN ANTIBIOTICS

Saul Wolfe, Kingston; Donald Westlake, and Susan Jensen, both of Edmonton, all of Canada, assignors to Queen's University at Kingston, Kingston, Canada

Continuation-in-part of Ser. No. 698,842, Feb. 6, 1985, abandoned, which is a continuation of Ser. No. 507,852, Jun. 27, 1983, Pat. No. 4,536,476, which is a continuation-in-part of Ser. No. 410,302, Aug. 23, 1983, abandoned. This application Jan. 23, 1986, Ser. No. 820,930

The portion of the term of this patent subsequent to Apr. 9, 2002, has been disclaimed.

Int. Cl.[4] C12N *11/08, 11/02;* C12P *37/00;* C12R *1/465*

U.S. Cl. 435—180 5 Claims

1. An immobilized enzyme reagent capable of continuously cyclizing, epimerizing and ring expanding L-α-aminoadipyl-L-cysteinyl-D-valine and analogs thereof to desacetoxycephalosporin and the respective analogs thereof, comprising an epimerase having a molecular weight of about 60,000, a cyclase having a molecular weight of about 36,500 and a ring expansion enzyme having a molecular weight of about 29,000, derived from a prokaryotic β-lactam producing organism selected from the group consisting of *S. clavuligerus, S. cattleya* and *S. lipmanii;* immobilized on a diethylaminoethyl ion exchange chromatographic resin.

4,693,978

TYPE II RESTRICTION ENDONUCLEASE MAEI, A PROCESS FOR OBTAINING IT AND THE USE THEREOF

Karl O. Stetter, Regensburg, and Rüdiger Schmitt, Niedergebraching, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Sep. 28, 1984, Ser. No. 655,468

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1984, 3401617

Int. Cl.[4] C12N *9/22, 9/16, 15/00;* C12R *1/01*

U.S. Cl. 435—199 6 Claims

1. A restriction endonuclease capable of recognizing and cleaving a DNA sequence at a position indicated by the arrows:

4,693,979

TYPE II RESTRICTION ENDONUCLEASE MAE II, A PROCESS FOR OBTAINING IT AND THE USE THEREOF

Karl O. Stetter, Regensburg, and Rüdiger Schmitt, Niedergebraching/Pentling, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

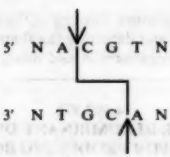
Filed Sep. 28, 1984, Ser. No. 655,469

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1984, 3401619

Int. Cl.[4] C12N *9/22, 9/16, 15/00;* C12R *1/01*

U.S. Cl. 435—199 6 Claims

1. A restriction endonuclease which capable of recognizing and cleaving a DNA sequence at a position indicated by the arrows



4,693,980

NEW TYPE II RESTRICTION ENDONUCLEASE MAE III, A PROCESS FOR OBTAINING IT AND THE USE THEREOF

Karl O. Stetter, Regensburg; Rüdiger Schmitt, Niedergebraching/Pentling, and Frank Laue, Pähl, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Sep. 28, 1984, Ser. No. 655,470

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1984, 3401620

Int. Cl.[4] C12N *9/22, 9/16, 15/00;* C12R *1/01*

U.S. Cl. 435—199 6 Claims

1. A restriction endonuclease capable of recognizing and cleaving a DNA sequence at a position indicated by the arrows

4,693,981

PREPARATION OF INACTIVATED VIRAL VACCINES

Gary P. Wiesehahn, Alameda; Richard P. Creagan, Alta Loma; David R. Stevens, Fremont, and Richard Giles, Alameda, all of Calif., assignors to Advanced Genetics Research Institute, Oakland, Calif.

Continuation-in-part of Ser. No. 563,939, Dec. 20, 1983, Pat. No. 4,545,987, and a continuation-in-part of Ser. No. 592,661, Mar. 23, 1984, abandoned. This application Oct. 7, 1985, Ser. No. 785,354

The portion of the term of this patent subsequent to Oct. 8, 2002, has been disclaimed.

Int. Cl.[4] A61K *39/12*

U.S. Cl. 435—238 9 Claims

1. A method for inactivating a live virus without substantially degrading their antigenic characteristics, said method comprising:

exposing the virus to a preselected intensity of long wavelength ultraviolet radiation and a preselected concentration of an inactivating furocoumarin for a time period sufficiently long to render the virus non-infectious but less than that which would result in degradation of its antigenic characteristics, wherein said exposure is performed in the substantial absence of oxygen and other oxidizing species.

4,693,982

ENZYMATICALLY-TREATED GUAR GUMS

Walter H. Carter, and Vinai K. Srivastava, both of Dalton, Ga., assignors to Millmaster Onyx Group, Inc., New York, N.Y.

Filed May 22, 1985, Ser. No. 736,667

Int. Cl.[4] C09K *7/00*

U.S. Cl. 435—274 7 Claims

1. A method of treating solid guar gum particles to reduce insoluble residues comprising impregnating said particles, while in the solid state, with a hydrolytic enzyme solution to produce hydrated solid free flowing particles, the concentration of said enzyme in said solution being sufficient to reduce insoluble residues when said particles are mixed with water.

4,693,983

REACTOR FOR CULTIVATING BIOLOGICAL MATERIAL SUCH AS IMMOBILIZED CELLS

Graham A. Davies, Macclesfield, and Ferda Mavituna, Stockport, both of England, assignors to National Research Development Corporation, London, England

PCT No. PCT/GB86/00192, § 371 Date Nov. 7, 1986, § 102(e) Date Nov. 7, 1986, PCT Pub. No. WO86/05802, PCT Pub. Date Oct. 9, 1986

PCT Filed Apr. 3, 1986, Ser. No. 937,063

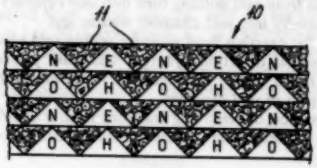
Claims priority, application United Kingdom, Apr. 4, 1985, 8508976

Int. Cl.[4] C12M *3/00*

U.S. Cl. 435—284 29 Claims

1. A reactor for cultivating biological material colonized therein, comprising a support matrix having a plurality of first channels for being colonized with biological material and defined by bounding walls across which the biological material cannot pass, each said first channel adjoining a second channel and a third channel and a fourth channel, the part of said boundary wall adjoining the second channel and the part of said boundary wall adjoining the fourth channel being respectively permeable to different materials.

23. A method of cultivating biological material, comprising colonizing the first channels of a reactor according to claim 1



with the biological material, applying nutrient to the second channels, applying extractant fluid to the third channels, applying one of a heat-transfer fluid of a gas to the fourth channels and applying the other of a heat-transfer fluid or a gas to the fifth channels if present.

4,693,984

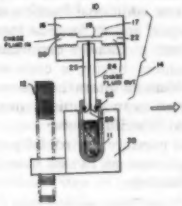
METHOD AND APPARATUS FOR SEQUENTIAL FRACTIONATION

Allen P. Minton, Bethesda, Md.; Arun K. Attri, New Delhi, India, and James V. Sullivan, Bowie, Md., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 724,033, Apr. 16, 1985, abandoned. This application Oct. 31, 1986, Ser. No. 925,452

Int. Cl.[4] G01N *1/18*

U.S. Cl. 436—180 13 Claims



1. An apparatus for removing fractions of a predetermined volume from a holding tube containing a liquid, with a concentration gradient of solute therein, comprising:

a capillary tube, for removing a fraction of a predetermined volume from a holding tube containing a liquid with a concentration gradient of solute therein, said concentration gradient including a plurality of said fractions of said predetermined volume;

said capillary tube having a bottom internal end flared outwardly at an angle of between 30 and 60° and having sealing means, for slidably sealing a bottom external end of said capillary tube within the interior of said holding tube, located above the flared end of said capillary tube;

means for mounting said capillary tube along a vertical axis with said outwardly flared internal end facing downward;

means for mounting said holding tube in an upright orientation below said capillary tube and along said vertical axis, and for placing said capillary tube into said holding tube so as to sealingly engage said sealing means with the interior surface of said holding tube;

means defining a chamber connected to an end of said capillary tube opposite to said outwardly flared internal end, said chamber having a cross-sectional area at least about

ten times larger than an internal cross-sectional area of said capillary tube, so as to essentially prevent mixing of the gradient in said holding tube when fractions are removed from said holding tube;

means for providing relative incremental movement of said capillary tube and said holding tube to force a layer of liquid from said holding tube into said capillary tube, and eventually into said chamber means; and

means for exerting fluid pressure within said chamber in a horizontal direction, wherein said fluid pressure forces any liquid within said chamber horizontally through an exit port in said chamber.

9. A method of removing fractions from a centrifuge tube having a concentration gradient of solute therein, comprising the steps of:

(a) selecting a fraction volume;

(b) selecting a capillary tube having a volume of no more than about twice the volume of said selected fraction volume said capillary tube having one internal end flared outwardly at an angle of between 30° to 60° and having an O-ring having an outer diameter slightly smaller than the inner diameter of said centrifuge tube, said O-ring being fitted externally about said capillary tube above the flared end thereof;

(c) maintaining said capillary tube, flared side down, along a vertical axis;

(d) positioning a centrifuge tube having liquid therein in an upright orientation below said capillary tube and along said vertical axis;

(e) inserting said capillary tube into said centrifuge tube so as to sealingly engage said O-ring with the interior surface of said centrifuge tube;

(f) increasing the depth at which said flared end of said inserted capillary tube rests within said centrifuge tube so as to cause a first fraction of said selected volume of said liquid to enter said capillary tube;

(g) further increasing the depth at which said flared end of said capillary tube rests within said centrifuge tube so as to cause at least one additional fraction of said selected volume of said liquid and to force at least a portion of said first fraction into a chamber connected to said capillary tube, said chamber having a cross-sectional area sufficiently larger than an internal cross-sectional area of said capillary tube so as to essentially prevent mixing of the gradient in said centrifuge tube;

(h) exerting fluid pressure horizontally across said chamber to force said portion out of said chamber through an exit port in said chamber.

4,693,985

METHODS OF CONCENTRATING LIGANDS AND ACTIVE MEMBRANES USED THEREFOR

Peter J. Degen, Huntington; Jerold Martin, Plainview; Judy Schriefer, Commack, all of N.Y., and Brenda Shirley, Athens, Ga., assignors to Pall Corporation, Glen Cove, N.Y.

Filed Aug. 21, 1984, Ser. No. 642,899

Int. Cl.[4] B01D *15/08, 39/00;* **G01N** *33/545*

U.S. Cl. 436—531 **61 Claims**

1. A method of preparing a biologically active membrane having a large surface area comprising the steps of:

reacting a hydrophilic, microporous, skinless polyamide membrane with an activating agent to form a chemically activated membrane, and

reacting said chemically activated membrane with an acceptor molecule to form a biologically active membrane, said acceptor molecule being a member selected from the group consisting of a monoclonal antibody, a polyclonal antibody, an antigenic substance, a glycoprotein, Protein A, a lectin, a carbohydrate, an enzyme substrate, a cofactor, an inhibitor, a hormone, an IgG class of immunoglobulin, a carrier protein, a receptor, heparin, a coagulation factor, and a histone.

28. A method for recovering a ligand from a solution including passing a ligand solution through a biologically active membrane comprising an acceptor molecule selected from the group consisting of a monoclonal antibody, a polyclonal anitbody, an antigenic substance, a glycoprotein, Protein A, a lectin, a carbohydrate, an enzyme substrate, a cofactor, an inhibitor, a hormone, an IgG class of immunoglobulins, a carrier protein, a receptor, heparin, a coagulation factor, and a histone covalently bound to a hydrophilic, microporous, skinless polyamide membrane and binding said ligand to said biologically active membrane.

4,693,986

CERAMIC PROCESS AND PRODUCTS

Jaroslav Vit, Union, N.J.; Ronald L. Salsbury, Dublin, and Don J. Henderson, Danville, both of Calif., assignors to Orthomatrix, Inc., Dublin, Calif.

Continuation of Ser. No. 748,547, Jun. 25, 1985. This application Jan. 21, 1987, Ser. No. 9,612

Int. Cl.[4] C04B *35/00;* **C07C** *61/06*

U.S. Cl. 501—1 **16 Claims**

1. Ceramic particles of a calcium phosphate material suitable as an implant or prosthesis material, characterized by a bulk density between about 80% and about 95% of the theoretical bulk density of the calcium phosphate material, a size range of between 10 and 80 mesh, and a network of micropores in the individual particles sufficient to permit tissue attachment when the particles are employed as an implant or prosthesis material wherein said micropores have a medium pore size of about 1.5 microns as determined by mercury porosimetry.

4,693,987

MOLYBDENUM SEALING GLASSES

Paul S. Danielson, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Sep. 8, 1986, Ser. No. 904,285

Int. Cl.[4] C03C *3/587*

U.S. Cl. 501—70 **3 Claims**

1. A glass exhibiting a strain point between 718°–725° C., a linear coefficient of thermal expansion (0°–300° C.) between $46.2–50.1\times10^{-7}$/°C., a liquidus temperature between 1145°–1180° C., a viscosity at the liquidus temperature of at least 50,000 poises, and essentially zero tensile axial stress at room temperature when sealed to molybdenum metal, said glass consisting essentially, expressed in terms of weight percent on the oxide basis, of 9.1–13.1% BaO, 10.7–11.9% CaO, 14.6–15.1% Al_2O_3, and 60.5–62.4% SiO_2.

4,693,988

SINGLE PHASE SILICON CARBIDE REFRACTORY

Wolfgang D. G. Boecker, and Tadeusz M. Korzekwa, both of Lewiston, N.Y., assignors to Kennecott Corporation, Cleveland, Ohio

Filed Jul. 1, 1986, Ser. No. 880,708

Int. Cl.[4] C04B *35/56*

U.S. Cl. 501—89 **13 Claims**

1. The method of producing a single phase silicon carbide article comprising the steps of:

(a) forming a particulate silicon carbide mixture made up of the following size fractions:

(i) particles ranging from about 0.21 mm to about 3.4 mm,

(ii) particles ranging from less than about 0.21 mm to about 0.003 mm, and

(iii) particles less than 0.003 mm in size, having an average particle size of less than one micron each of said fractions being present in the mixture in amounts of from about 5 to about 75% by weight, the sum of said fractions equaling 100%,

(b) adding up to about 3.0% by weight based upon the weight of the smallest size fraction of a sintering aid,

(c) adding carbon in excess of the stoichiometric amount required to combine with any silica or other oxygen source that may be present,

(d) shaping the mixture to form a green body, and

(e) firing said shaped body for such time, at such temperature and in such environment as to produce a pressureless sintered silicon carbide article.

4,693,989

PREPARATION AND SINTERING OF REFRACTORY METAL BORIDES, CARBIDES AND NITRIDES OF HIGH PURITY

Ajit Y. Sane, Willoughby, Ohio, assignor to Eltech Systems Corporation, Boca Raton, Fla.

Continuation-in-part of Ser. No. 625,599, Jun. 28, 1984, abandoned. This application May 29, 1985, Ser. No. 737,930

Int. Cl.[4] C04B *35/58*

U.S. Cl. 501—96 **6 Claims**

1. The method of preparing a consolidated and purified Group IVb, Vb or VIb refractory metal boride, carbide, nitride, or mixture, combination or cermet thereof by means of aided, reduced pressure and elevated temperature conditions, which method comprises:

(a) establishing a composition for a second stage reaction step of reaction sintering and adapted for enhanced production of desired product;

(b) providing sintering aid at least in part together with said composition and resting said composition upon said sintering aid, which aid is solid at normal pressure and temperatures and aids via the vapor phase at the pressure and temperature conditions of the second stage reaction step;

(c) reducing the pressure around said composition;

(d) heating said composition at a temperature for sintering; while

(e) establishing sintering aid atmosphere in contact with said composition; and

(f) maintaining the heating for a time sufficient to consolidate said composition, and thereby prepare a consolidate and purified product.

4,693,990

PRODUCTION OF CATALYST COMPONENT FOR OLEFIN POLYMERIZATION

Furuhashi Hiroyuki; Tadashi Yamamoto; Masafumi Imai, and Hiroshi Ueno, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Toyko, Japan

Filed Jul. 3, 1986, Ser. No. 882,042

Claims priority, application Japan, Jul. 5, 1985, 60-146805

Int. Cl.[4] C80F *4/64*

U.S. Cl. 502—116 **19 Claims**

1. A titanium containing supported catalyst component comprising the product obtained by contacting:

(1) the reaction product obtained by contacting together

(a) a metal oxide or a composite of metal oxides of Group IIA, IIB, IIIA, IIIB, IVA or IVB of the Periodic Table,

(b) a dihydrocarbyl magnesium compound represented by the formula RMgR', mixtures thereof or a complex with an organic compound of aluminum, boron, beryllium or zinc, and

(c) a hydrocarbyloxy. group-containing compound represented by the formula $R''_qMm(OR''')_n$,

(2)

(d) a halogen-containing alcohol,

(3)

(e) an electron-donating compound, and

(4)

(f) a di-, tri-, or tetravalent titanium compound,

wherein R and R' are the same or different and are selected from alkyl, cycloalkyl, aryl and aralkyl groups having from 1 to 20 carbon atoms, R'' is a hydrogen atom or a hydrocarbyl group selected from alkyl, alkenyl, aryl or aralkyl groups having from 1 to 20 carbon atoms, R''' is a hydrocarbyl group having from 1 to 20 carbon atoms and selected from alkyl, alkenyl, aryl, or aralkyl groups, M is selected from silicon, carbon, phosphorous, boron or aluminum, m is the valence of M and $m>q\geqq 0$, $m\geqq n>0$ and n+q equal m.

4,693,991

HYDROTREATING CATALYST COMPOSITION

Geir Bjornson; Douglas D. Klendworth; Lloyd E. Gardner, and Floyd E. Farha, Jr., all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 858,772, May 2, 1986, Pat. No. 4,655,906. This application Oct. 16, 1986, Ser. No. 919,360

Int. Cl.[4] B01J *27/51, 23/28*

U.S. Cl. 502—220 **16 Claims**

1. A composition of matter, suitable as a catalyst composition for hydrotreatment of liquid polyaromatics-containing feed streams, comprising:

(a) alumina,

(b) zinc titanate,

(c) at least one compound of molybdenum,

(d) at least one compound of nickel, and

(e) at least one compound of rhenium;

wherein said composition of matter comprises from about 1 to about 20 weight-% Mo, from about 0.5 to about 8 weight-% Ni and from about 0.2 to about 4 weight-% Re.

8. A composition of matter in accordance with claim 1, having been prepared by a process comprising the steps of:

(i) mixing alumina and zinc titanate;

(ii) impregnating the mixture of alumina and zinc titanate obtained in step (i) with at least one aqueous solution containing compounds of Mo, of Ni and of Re;

(iii) drying the thus impregnated mixture obtained in step (ii);

(iv) calcining the dried mixture obtained in step (iii) under such conditions and at a temperature high enough to convert the compounds of Mo, of Ni and of Re to oxides of Mo, of Ni and of Re.

13. A composition of matter in accordance with claim 8, comprising the additional step of (v) contacting the material obtained in step (iv) with a sulfur compound under such conditions as to at least partially convert oxides of Mo, Ni and Re to sulfides of Mo, Ni and Re.

4,693,992

BACITRACIN-METAL-POLYETHER ANTIBIOTIC COMPLEXES

Vernon V. Young, Terre Haute, Ind., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Aug. 26, 1985, Ser. No. 769,066

Int. Cl.[4] A61K *37/02, 31/70*

U.S. Cl. 514—11 **17 Claims**

1. A complex of bacitracin, a polyether antibiotic ionophore and a non-toxic complex-forming metal ion, said complex being crystalline.

4,693,993

BRADYKININ ANTAGONIST PEPTIDES

John M. Stewart, 3690 E. Dartmouth Ave., Denver, Colo. 80210, and Raymond J. Vavrek, 1250 Poplar St., Denver, Colo. 80220

Filed Jun. 13, 1985, Ser. No. 744,207

Int. Cl.[4] C07K *37/42, 7/18, 7/06, 7/08*

U.S. Cl. 514—14 **21 Claims**

1. A modified bradykinin type peptide having the formula

A - Arg - B - C - D - W - X - Y - Z - Arg

and the pharmaceutically acceptable salts thereof wherein

a. A is selected from the group comprising
(i) hydrogen
(ii) Arg
(iii) Lys-Lys
(iv) Phe
(v) Thi
(vi) Lys
(vii) Met-Lys
(viii) Gly-Arg-Met-Lys

b. B is selected from the group comprising
(i) Azetidine-2-Carboxylic Acid (Azt)
(ii) Thiazolidine-2-Carboxylic acid (THz)
(iii) Isonipecotic acid (Inip)
(iv) Pro
(v) 2, 3-Dehydroproline (ΔPro)
(vi) 4-Hydroxyproline (Hyp)
(vii) Hydroxyproline
(viii) Aib
(ix) Dehydroproline
(x) Lys-Lys-Hyp
(xi) Ala
(xii) Sar
(vii) beta-(2-Naphthyl)-Alanine (Nal)
(viii) Leu
(ix) Lys-Lys-Thi
(x) Serine (Ser)
(xi) Tyr

f. X is selected from the group comprising
(i) Ser
(ii) Gly
(iii) Phe
(iv) Para-Chloro-D-phenylalanine (CDF)
(v) Nal
(vi) Pal
(vii) Thi
(viii) pCl-Phe

g. Y is selected from the group comprising
(i) DNal
(ii) DPNF
(iii) DPhe
(iv) DTyr
(v) DPal
(vi) DOMT
(vii) DThi
(viii) DAla
(ix) DTrp
(x) pNO2 - DPhe (PNF)
(xi) DPro
(xii) DHis
(xiii) D-Homo-Phe (DhPhe)
(xiv) pCl-DPhe(CDF)
(xv) DPhg
(xvi) D-Val
(xvii) Lys-Lys-Dtrp
(xviii) Lys-Lys-DHis
(xix) DIle

h. Z is selected from the group comprising
(i) Phe
(ii) beta-(2-thienyl) alanine (Thi)
(iii) 0-methyltyrosine (OMT)
(iv) beta-(2-pyridyl) alanine (Pal)
(v) para-chloro-L-phenylalanine (CLF)
(vi) para-nitrophenylalanine (PNF)
(vii) beta-(2-naphthyl) - alanine (Nal)
(viii) Leu
(ix) Lys-Lys-Thi
(x) Tyr

4,693,994

PROTECTIVE SYNTHETIC PEPTIDE AGAINST MALARIA AND ENCODING GENE

Thomas F. McCutchan, Silver Spring, and Richard Wistar, Jr., Bethesda, both of Md., assignors to The Government of the United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Nov. 19, 1985, Ser. No. 799,464
Int. Cl.[4] A61K *37/02*; C07K *7/06*
U.S. Cl. 514—15 4 Claims

1. A synthetic peptide having an amino acid sequence: Gly-Asp-Arg-Ala-Asp-Gly-Gln-Pro-Ala.

4,693,995

PHARMACEUTICAL COMPOSITION FOR THE TREATMENT OF ACUTE MYOCARDIAL ISCHEMIA

Giuseppe Prino, Milan; Marisa Mantovani, Villa Guardia Como, and Riccardo Niada, Varese, all of Italy, assignors to Crinos Industria Farmacobiologica S.p.A., Como, Italy

Filed Feb. 14, 1985, Ser. No. 701,695
Claims priority, application Italy, Feb. 16, 1984, 19645 A/84
Int. Cl.[4] A61K *31/70*
U.S. Cl. 514—44 5 Claims

1. A method of testing acute myocardial ischemia in a patient in need of such treatment, comprising administering to said patent a therapeutically effective amount of defibrotide in a pharmaceutically acceptable, inert carrier.

4,693,996

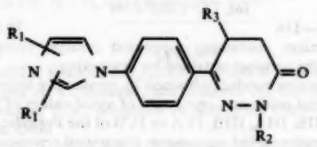
METHOD OF TREATING HEART FAILURE AND MEDICAMENTS THEREFOR

Robert P. Steffen, Saline, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 23, 1985, Ser. No. 812,876
Int. Cl.[4] A61K *31/70*
U.S. Cl. 514—46 5 Claims

1. A pharmaceutical composition for increasing myocardial contractility and cardiac output comprising

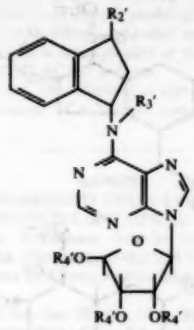
(a) an effective amount of a compound of the formula



I

wherein R_1 and R_1' are independently hydrogen or alkyl of one to three carbon atoms; R_2 is hydrogen, alkyl of one to three carbon atoms or 2-hydroxyethyl; and R_3 is hydrogen or alkyl of one to three carbon atoms, or a pharmaceutically acceptable acid addition salt thereof, with

(b) an effective amount of a compound of the formula



II

wherein R_2' and R_3' are independently hydrogen or alkyl of one to three carbon atoms; and R_4' is hydrogen, acetyl or benzoyl; its diastereomers or mixtures thereof, or a pharmaceutically acceptable acid addition salt thereof, and a pharmaceutically acceptable carrier.

4,693,997

NOVEL PHARMACEUTICAL COMPOSITION

Carl-Aage Bergwitz-Larsen, Vällingby, and Rolf G. L. Österlund, Vallentuna, both of Sweden, assignors to KabiVitrum AB, Stockholm, Sweden

Division of Ser. No. 472,295, Mar. 4, 1983, Pat. No. 4,536,495. This application Jun. 7, 1985, Ser. No. 742,668

Claims priority, application Sweden, Mar. 12, 1982, 8201556

Int. Cl.[4] A61K *31/715, 31/65*

U.S. Cl. 514—54 **14 Claims**

1. A complex of carrageenan and 10–70% by weight of said complex of doxycycline, calculated as doxycycline hydrochloride.

4,693,998

NOVEL COMPOUNDS OF THE MURAMYL PEPTIDE

Pierre Lefrancier, Bures Sur Yvette; Monique Parant, Paris; Francoise Audibert, Neuilly Sur Seine; Louis Chedid; Jean Choay, both of Paris, and Edgar Lederer, Sceaux, all of France, assignors to Agence Nationale de Valorisation de la Rechersche, France

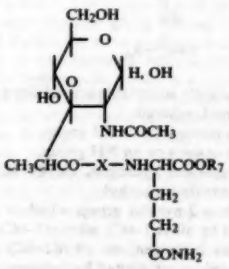
Continuation of Ser. No. 391,140, Jun. 23, 1982, , Continuation of Ser. No. 131,138, Mar. 17, 1980, , Continuation of Ser. No. 045,401, Jun. 14, 1979. This application Nov. 7, 1985, Ser. No. 797,771

Claims priority, application France, Jun. 5, 1978, 79 16793

Int. Cl.[4] A61K *31/70;* **C07H** *5/04*

U.S. Cl. 514—62 **20 Claims**

1. A compound of the formula



wherein X is selected from the group consisting of L-alanyl, L-seryl and L-valyl;

and R_7 is selected from the group consisting of CH_3, C_2H_5, C_3H_7, C_4H_9, C_5H_{11}, C_6H_{13} and $C_{10}H_{21}$.

4,693,999

LIPOSOMES CONTAINING STEROID ESTERS

Bengt I. Axelsson, Genarp; Ralph L. Brattsand; Carl M. O. Dahlbäck, both of Lund; Leif A. Källström, Södra Sandby, and Jan W. Trofast, Lund, all of Sweden, assignors to Aktiebolaget Draco, Sweden

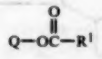
Filed Jul. 3, 1985, Ser. No. 752,257

Claims priority, application Sweden, Jul. 30, 1984, 8403905

Int. Cl.[4] A61K *31/56, 31/58;* **C07J** *00/00*

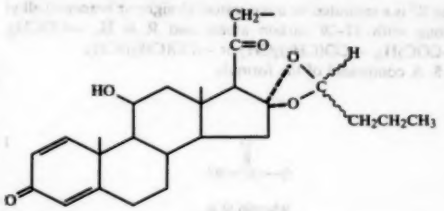
U.S. Cl. 514—174 **7 Claims**

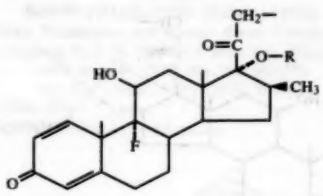
1. A pharmaceutical composition for administration primarily to the respiratory tract comprising liposomes in combination with an antiinflammatory and antiallergic effective amount of a compound of the formula

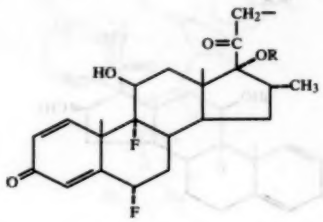


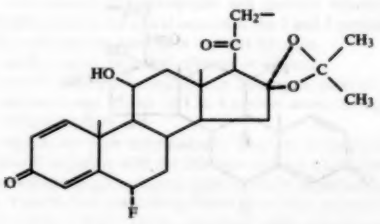
I

wherein Q is









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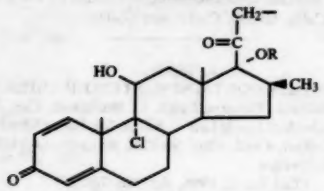

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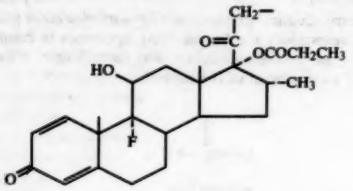
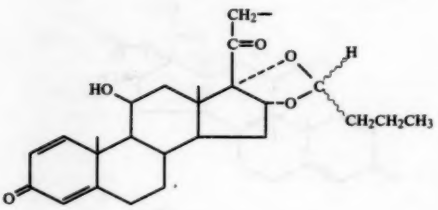


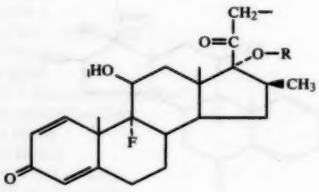
and R^1 is a saturated or unsaturated, straight or branched alkyl group with 11–19 carbon atoms and R is H, $-COCH_3$, $-COC_2H_5$, $-CO(CH_2)_2CH_3$ or $-CO(CH_2)_3CH_3$.

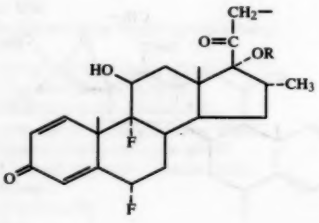
5. A compound of the formula

I

wherein Q is







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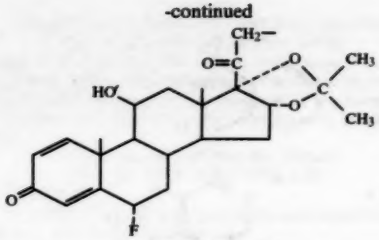
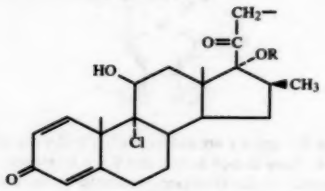
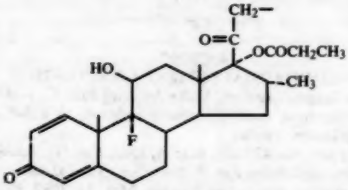


or





and R^1 is a saturated or unsaturated straight or branched alkyl group with 11–19 carbon atoms and R is H, $-COCH_3$, $-COC_2H_5$, $-CO(CH_2)_2CH_3$ or $-CO(CH_2)_3CH_3$.

4,694,000

QUINAZOLINE AND ISOQUINOLINE DERIVATIVES

Hendrik Timmerman, Voorschoten, and Henderikus Van der Goot, Goofddorp, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

PCT No. PCT/EP84/00312, § 371 Date Dec. 6, 1984, § 102(e) Date Dec. 6, 1984, PCT Pub. No. WO 85/01501 PCT Pub. Date Apr. 11, 1985

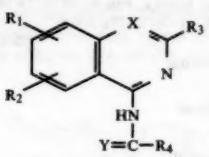
PCT Filed Sep. 28, 1984, Ser. No. 679,000

Claims priority, application Netherlands, Sep. 29, 1983, 83.03328

Int. Cl.[4] A61K *31/47, 31/505;* **C07D** *401/04*

U.S. Cl. 514—187 **33 Claims**

1. Compound of the formula:



and pharmaceutically acceptable acid addition salts and copper complexes thereof, wherein

X represents nitrogen or a CH group,

Y represents oxygen or an NH group,

R_1 and R_2 represent hydrogen, alkyl(1–6C), alkoxy(1–6C), halogen or trifluoromethyl,

R_3 represents a 2-pyridyl group which is unsubstituted or substituted by alkyl(1–6C), alkoxy(1–6C) or halogen,

R_4 represents hydrogen, an alkyl(1–6C) group which is unsubstituted or substituted by halogen, alkoxy(1–6C) or

phenyl groups, a cyclic alkyl group (3–8C) or an aromatic group selected from phenyl, naphthyl, pyridyl, pyrimidyl, pyrazinyl, furyl, thienyl, oxazolyl and thiazolyl, which aromatic group is unsubstituted or substituted by alkyl(1–6C), alkoxy(1–6C) or halogen.

13. Feed mixture, characterised in that it contains a biocidally effective amount of a biocide compound according to claim **1**.

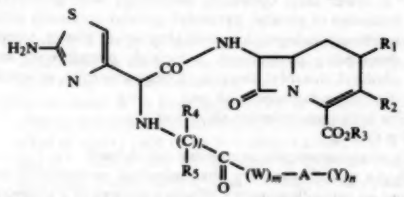
4,694,001

β-LACTAM COMPOUND AND A PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Tadashi Hirata, Yokohama; Kenichi Mochida, Hiratsuka; Chihiro Shiraki, Machida, and Kiyoshi Sato, Mishima, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 591,254, Mar. 20, 1984, abandoned, which is a continuation of Ser. No. 424,633, Sep. 27, 1982, abandoned. This application Nov. 26, 1984, Ser. No. 674,710
Claims priority, application Japan, Oct. 1, 1981, 56-156752
Int. Cl.[4] **C07D** *205/12;* **A61K** *31/395*
U.S. Cl. 514—210 **5 Claims**

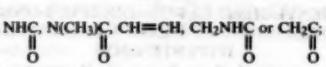
1. A β-lactam compund of the formula:



wherein

Y is a hydroxyl group, a lower alkanoyloxy group or a lower alkoxycarbonyloxy group;

W is a group represented by CH_2, NH,



A is a phenyl group, a naphthyl group, or a chromonyl group, respectively substituted by $(Y)_n$;

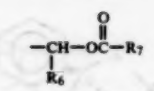
R_1 is a hydrogen atom, a hydroxyl group, a methoxy group or a lower alkyl group;

R_2 is a hydrogen atom, a halogen atom, a methoxy group or a group represented by

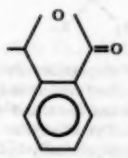
CH_2R_2' wherein R_2' is a hydrogen atom, an azido group, a lower alkanoyloxy group, a carbamoyloxy group, a pyridinium group, a substituted pyridinium group wherein the substitutuent is $-(CH_2)_p-R_A$ wherein R_A is a carbamoyl group, carboxyl group, cyano group or lower alkoxycarbonyl group having 2 to 5 carbon atoms, and p is 0, 1, 2 or 3; or $-R_B-SO_3-R_C$ wherein R_B is a lower alkylene group having 1 to 3 carbon atoms, and R_C has the same meaning as R_3, or

a substituted or unsubstituted heterocyclic thio group wherein the heterocyclic group is a tetrazolyl group, thiadiazolyl group, triazolyl group, triazinyl group or thiazolyl group and wherein the substituent is a lower alkyl group having 1 to 5 carbon atoms, hydroxyl group, oxo group, amino group, nitro group, $(CH_2)_qCO_2H$, $(CH_2)_qCO_2$—(alkyl group having 1–4 carbon atoms), $(CH_2)_qSO_3H$, $(CH_2)_q$—N (alkyl group having 1–4 carbon atoms)$_2$, and q represents an integer of 1 to 3;

R_3 is a hydrogen atom, an alkali metal, an alkaline earth metal, an ammonium group of a basic amino acid or an ester residue represented by the formula:



wherein R_6 represents a hydrogen atom or a lower alkyl group having 1 to 6 carbon atoms, and R_7 represents a lower alkyl group having 1 to 6 carbon atoms, or a phenyl group, or the formula



R_4 and R_5 each are hydrogen atom, a lower alkyl group or a cycloalkylidene group with a carbon atom combined therewith; l is 0 or an integer of 1, 2 or 3; m is 0 or 1; and n is an integer of 1, 2, 3, 4 or 5.

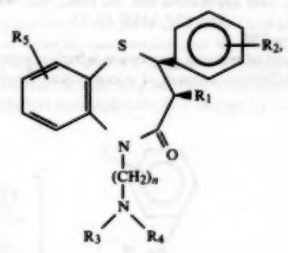
4,694,002

BENZOTHIAZEPINE DERIVATIVES

David Floyd, Pennington, and Karnail Atwal, Cranbury, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 21, 1986, Ser. No. 898,570
Int. Cl.[4] **A61K** *31/55;* **C07D** *281/10*
U.S. Cl. 514—211 **15 Claims**

1. A compound having the formula



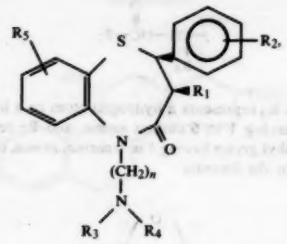
or a pharmaceutically acceptable salt thereof, wherein the stereochemistry at the chiral centers in the 2 and 3-positions of the benzothiazepine nucleus is cis, and wherein

R_1 is alkyl, aryl, arylalkyl, alkenyl or alkynyl;

R_2 and R_5 are each independently hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen or trifluoromethyl; and

R_3 and R_4 are each independently alkyl or cycloalkyl or R_3 and R_4 together with the nitrogen atom to which they are attached are pyrrolidinyl, piperidinyl or morpholinyl.

15. A method of controlling blood pressure in a mammalian host in need thereof, which comprises administering to said host an effective amount of a compound having the formula



or a pharmaceutically accpetable salt thereof, wherein the stereochemistry at the chiral centers in the 2 and 3-position of the benzothiazepine nucleus is cis, and wherein

R_1 is alkyl, aryl, arylalkyl, alkenyl or alkynyl;

R_2 and R_5 are each independently hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen or trifluoromethyl; and

R_3 and R_4 are each independently alkyl or cycloalkyl or R_3 and R_4 together with the nitrogen atom to which they are attached are pyrrolidinyl, piperidinyl or morpholinyl.

4,694,003

METHOD OF TREATING DEPRESSION WITH 5-(AMINOALKYL)-11-PHENYL-5H-DIBENZO(B,E)(1,4) DIAZEPINES

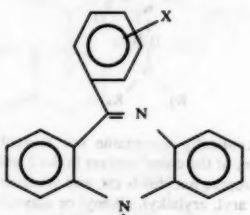
Chandler R. Taylor, Jr., Mechanicsville, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Continuation-in-part of Ser. No. 305,076, Sep. 24, 1981, abandoned. This application Jul. 30, 1982, Ser. No. 403,757

Int. Cl.[4] A61K *31/55*

U.S. Cl. 514—220 **6 Claims**

1. A method of treating depression which comprises administering an effective amount of a compound having the formula:



wherein

R^1 and R^2 are selected from the group consisting of hydrogen or methyl,

X is selected from the group consisting of hydrogen, chlorine, bromine or fluorine, and the pharmaceutically acceptable acid addition salts thereof.

4,694,004

SEMICARBAZIDE DERIVATIVES, PROCESSES FOR PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITION COMPRISING THE SAME

Osamu Nakaguti; Norihiko Shimazaki, both of Toyonaka; Yoshio Kawai, Tokyo; Masashi Hashimoto, Takarazuka, and Michie Nakatuka, Yokohama, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

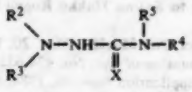
Filed Jun. 19, 1985, Ser. No. 746,510

Claims priority, application United Kingdom, Jul. 9, 1984, 8417453; May 7, 1985, 8511553

Int. Cl.[4] A61K *31/44*; C07D *401/12, 413/12, 211/68*

U.S. Cl. 514—228 **13 Claims**

1. A compound of the formula:



wherein

R^2 and R^3 are taken together with the attached nitrogen atom to form tetrahydropyridyl optionally substituted with lower alkyl,

R^4 is lower alkyl optionally substituted with di(lower)alkylamino or pyridyl, pyrazolyl, pyridyl optionally substituted with halogen, lower alkyl or lower alkoxy, tetrahydropyridyl, pyrimidinyl, pyrazinyl, pyrrolidinyl, morpholinyl, thiazolyl, thiazolinyl, benzothiazolyl, or tetrahydrofuryl substituted with oxo,

R^5 is hydrogen or lower alkyl, and

X is O or S,

and a pharmaceutically acceptable salt thereof.

10. An antiinflammatory pharmaceutical composition comprising an anti-inflammatory effective amount of a compound of claim 1, as an active ingredient, in association with a pharmaceutically acceptable, substantially nontoxic carrier or excipient.

4,694,005

5-PHENYL-3H,6H-1,3,4-OXADIAZINE-2-ONES IN TREATMENT OF HEART FAILURE AND HYPERTENSION

David Brown, Macclesfield; Rodney B. Hargreaves, Poynton; Bernard J. McLoughlin, and Stuart D. Mills, both of Macclesfield, all of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

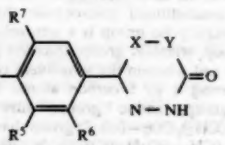
Division of Ser. No. 660,135, Oct. 12, 1984, Pat. No. 4,584,298, which is a division of Ser. No. 436,801, Oct. 26, 1982, Pat. No. 4,495,185. This application Apr. 22, 1986, Ser. No. 854,479

Claims priority, application United Kingdom, Nov. 12, 1981, 8134175

Int. Cl.[4] A61K *31/535*

U.S. Cl. 514—234 **2 Claims**

1. A method for the treatment of hypertension, in a warm blooded animal in need of such treatment, which comprises administering to said animal an effective amount of a heterocyclic compound of the formula:



wherein X is $—CR^1R^2$ and Y is —O—, wherein R^1 and R^2, which may be the same or different, each is hydrogen or alkyl of up to 4 carbon atoms;

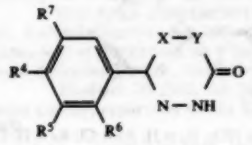
wherein either R^4 is hydrogen, fluoro or chloro, or alkyl,

alkenyl, halogenoalkyl, aminoalkyl, hydroxyalkyl, alkoxyalkyl or alkoxy each of up to 6 carbon atoms, and R^5, R^6 and R^7, which may be the same or different, each is hydrogen, fluoro, chloro, bromo or iodo, or alkyl, alkenyl, halogenoalkyl, aminoalkyl, hydroxyalkyl, alkoxyalkyl or alkoxy each of up to 6 carbon atoms, provided that R^4, R^5, R^6 and R^7 are not all hydrogen;

or R^4 is bromo and R^5, R^6 and R^7 have the meanings stated above, provided that R^5, R^6 and R^7 are not all hydrogen;

or R^4 and R^5 together, or R^5 and R^6 together, or R^4 and R^7 together, form the —CH—CH=CH—CH— group and the other two of R^4, R^5, R^6 and R^7 have the meanings stated above.

2. A method of the treatment of acute or chronic heart failure in a warm blooded animal in need of such treatment, which comprises administering to said animal an effective amount of heterocyclic compound of the formula:



wherein X is $—CR^1R^2$ and Y is —O—, wherein R^1 and R^2, which may be the same or different, each is hydrogen or alkyl of up to 4 carbon atoms;

wherein either R^4 is hydrogen, fluoro or chloro, or alkyl, alkenyl, halogenoalkyl, aminoalkyl, hydroxyalkyl, alkoxyalkyl or alkoxy each of up to 6 carbon atoms, and R^5, R^6 and R^7, which may be the same or different, each is hydrogen, fluoro, chloro, bromo or iodo, or alkyl, alkenyl, halogenoalkyl, aminoalkyl, hydroxyalkyl, alkoxyalkyl or alkoxy each of up to 6 carbon atoms, provided that R^4, R^5, R^6 and R^7 are not all hydrogen;

or R^4 is bromo and R^5, R^6 and R^7 have the meanings stated above, provided that R^5, R^6 and R^7 are not all hydrogen;

or R^4 and R^5 together, or R^5 and R^6 together, or R^4 and R^7 together, form the —CH=CH—CH=CH— group and the other two of R^4, R^5, R^6 and R^7 have the meanings stated above.

4,694,006

ACYL- OR ACYLOXYMETHYL-ALLOPURINOL PRODRUGS

Hans Bundgaard, Horsholm, and Erik Falch, Vedbaek, both of Denmark, assignors to A/S GEA, Copenhagen, Denmark

PCT No. PCT/DK84/00057, § 371 Date Feb. 26, 1985, § 102(e) Date Feb. 26, 1985, PCT Pub. No. WO85/00368, PCT Pub. Date Jan. 31, 1985

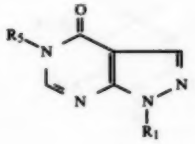
PCT Filed Jun. 19, 1984, Ser. No. 711,583

Claims priority, application Denmark, Jun. 30, 1983, 3028/83

Int. Cl.[4] A61K *31/505;* **C07D** *487/04*

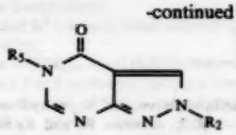
U.S. Cl. 514—258 **17 Claims**

13. A pharmaceutical composition for rectal, parenteral, or oral use in the prevention and treatment of hyperuricemic states such as gout comprising a pharmaceutically acceptable carrier or excipient in combination with a compound of the formula I'a or Ib



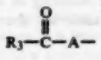
I'a

-continued



Ib

wherein R_1 is a group of the formula II



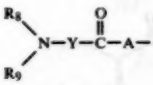
II

wherein R_3 is C_{1-8} alkyl; C_{1-4} alkyl monosubstituted with chloro or bromo; phenyl; phenyl substituted with 1–3 substituents selected from chloro, bromo, C_{1-4} alkyl, hydroxy, C_{1-4} alkoxy, acetoxy, or phenoxy; phenyl C_{1-4} alkyl in which the phenyl group may be substituted with 1–3 substituents selected from chloro, bromo, C_{1-4} alkyl, hydroxy, C_{1-4} alkoxy, acetoxy or phenoxy; or phenyl C_{1-4} alkenyl in which the phenyl group may be substituted with 1–3 substituents selected from chloro, bromo, C_{1-4} alkyl, hydroxy, C_{1-4} alkoxy, acetoxy, or phenoxy; or R_3 is an aromatic 5- or 6-membered heterocyclic ring selected from pyridinyl, thienyl, thiazolyl, oxazolyl, imidazolyl, isoxazolyl, isothiazolyl, furanyl and pyrimidinyl; and A is a single bond or a group of the formula IIa

IIa

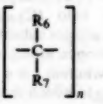
wherein the carbon atom is attached to the nitrogen atom of the parent ring system, and wherein R_6 and R_7 are the same or different and each represent hydrogen or have the same meaning as R_3 as defined above;

or R_1 is a group of the formula III



III

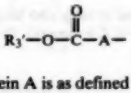
wherein R_8 and R_9 are the same or different and each represent hydrogen or have the same meaning as R_3 as defined above; or R_8 and R_9 together with the adjacent nitrogen form a 5- or 6-membered heterocyclic ring selected from piperidinyl, imidazolyl, pyrazolyl and piperazinyl; Y is a group of the formula IIIa



IIIa

wherein n is an integer from 1 to 5; and A, R_6, and R_7 are as defined above;

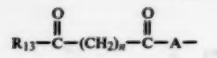
or R_1 is a group of the formula IV



IV

wherein A is as defined above and R'_3 has the same meaning as R_3 defined above;

or R_1 is a group of the formula VII



VII

wherein n and A are as defined above, and R_{13} is hydroxy or a group of the formula $—NR_8R_9$ wherein R_8 and R_9 are as defined above;

R_2 is any of the groups II, III, IV, and VII as defined above with the proviso that A solely is the group IIa as defined above; and R_5 is hydrogen or has the same meaning as R_2 as defined above; or a pharmaceutically acceptable salt thereof.

4,694,007

USE OF TRIMETREXATE AS ANTIPARASITIC AGENT

Carmen Allegra, Vienna, Va.; James C. Drake, Ijamsville, Md.; Bruce A. Chabner, Potomac, Md.; Henry Masur, and Joseph A. Kovacs, both of Bethesda, Md., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed May 20, 1986, Ser. No. 865,055

Int. Cl.[4] A61K *31/505*

U.S. Cl. 514—260 **5 Claims**

1. A method for treating infections of Toxoplasmosis or *P. carinii* comprising administering to a mammelian host in need of said treatment an amount of trimetrexate effective to treat said Toxoplasmosis or *P. carinii.*

4,694,008

CHEMICAL COMPOUNDS

Thomas H. Brown, Tewin, and Graham J. Durant, Welwyn, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

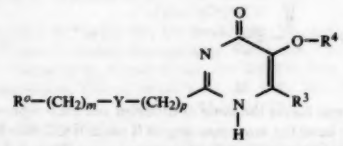
Filed Aug. 15, 1985, Ser. No. 765,766

Claims priority, application United Kingdom, Aug. 23, 1984, 8421427

Int. Cl.[4] A61K *31/505*; C07D *239/24*

U.S. Cl. 514—269 **10 Claims**

1. A compound of the formula (I):



or a pharmaceutically acceptable salt thereof, wherein:

R^o is 2-guanidinothiazol-4-yl or a group $R^1R^2N(CH_2)_n—z—$ wherein:

R^1 and R^2 are independently hydrogen, C_{1-6}alkyl, phenyl(C_{1-6})alkyl, furanyl(C_{1-6})alkyl, thienyl(C_{1-6})alkyl, C_{3-10}cycloalkyl, hydroxy(C_{2-6})alkyl, or halo (C_{2-6})alkyl (wherein said hydroxy and halo groups are not substituted on the carbon atom adjacent to the nitrogen atom); or

R^1 and R^2 together represent—$(CH_2)_r$—wherein r is 4 to 7, to form together with the nitrogen atom to which they are attached a 5–8 membered saturated ring;

n is an integer from 1 to 6;

z is 2,5-thienyl, 2,4-pyridyl wherein the $R^1R^2N(CH_2)_n$ group is in the 4-position, 2,4-thiazolyl wherein the $R^1R^2N(CH^2)$n group is in the 2-position, or 1,3- or 1,4-phenylene;

m is one; or if Z is pyridyl or phenylene m may also be zero;

Y is oxygen, sulphur or methylene; or if Z is furanyl, thienyl or thiazolyl Y may also be a bond;

p is two, three or four;

R^3 is hydrogen or C_{1-6}alkyl; and

R^4 is hydrogen of C_{1-6}alkyl.

10. A method of blocking histamine H_2-receptors which comprises administering to an animal an effective amount to block said receptors of a compound of claim 1.

4,694,009

PESTICIDAL COMPOSITIONS

Adolf Hubele, Magden; Helmut Zondler, Bottmingen; Peter Riebli, Buckten, all of Switzerland, and Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

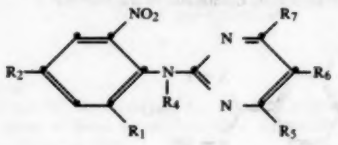
Filed Jun. 19, 1985, Ser. No. 746,432

Claims priority, application Switzerland, Jun. 25, 1984, 3055/84

Int. Cl.[4] C07D *239/42, 239/47*; A61K *31/505*

U.S. Cl. 514—269 **3 Claims**

1. A compound of the formula



wherein R_1 is CF_3; R_2 is NO_2; R_4 is H; R_5 is Cl; R_6 is H, Cl or Br; and R_7 is Cl, $OCHF_2$, OCH_3, OCH_2CF_3, $OCH_2CH=CH_2$ or $OCH_2C\equiv CH$.

4,694,010

ANTICONVULSANT COMPOSITIONS AND METHOD

Jose M. Musacchio, New York, N.Y., and Frank C. Tortella, Columbia, Md., assignors to New York University, New York, N.Y.

Filed Aug. 16, 1985, Ser. No. 766,838

Int. Cl.[4] A61K *31/44, 31/415*

U.S. Cl. 514—304 **26 Claims**

1. A method for controlling seizures in a mammal in need of such treatment comprising administering to said mammal an amount of:

(a) an antiepileptic hydantoin; and

(b) an antiepileptic hydantoin-potentiating amount of a compound selected from the group consisting of dextromethorphan, caramiphen and carbetapentane; said amounts in combination being effective for controlling seizures in said mammal.

4,694,011

NOVEL 7-HYDROXY-INDOLES

Lucien Nedelec, Le Raincy; Gilles Hamon, Montrouge; Patrick Fauveau, Livry Gargan, and Claude Oberlander, Paris, all of France, assignors to Roussel Uclaf, Paris, France

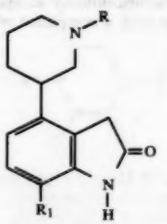
Filed Mar. 10, 1986, Ser. No. 838,242

Claims priority, application France, Mar. 12, 1985, 85 03585

Int. Cl.[4] C07D *209/34*; A61K *31/40*

U.S. Cl. 514—323 **15 Claims**

1. A compound selected from the group consisting of 7-hydroxy-indoles of the formula



I

wherein R is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms, cycloalkylalkyl of 4 to 7 carbon atoms and aralkyl of 7 to 12 carbon atoms optionally substituted by one or more members of the group consisting of alkyl and alkoxy of 1 to 5 carbon atoms, halogen and alkenyl and alkynyl of 3 to 5 carbon atoms with the multiple bond being other than between the carbons α- and β- to the nitrogen atom, R_1 is selected from the group consisting of —OH, alkoxy of 1 to 5 carbon atoms, phenoxy and phenylalkoxy of 7 to 9 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

6. A composition having peripheral cardiovascular activity comprising an amount of at least one compound of claim 1 sufficient to impart peripheral cardiovascular activity and an inert pharmaceutical carrier.

4,694,012
METHOD OF TREATING OF PREVENTING DISEASES USING 1,4-DIHYDROPYRIDINES

John L. Archibald, Farnham Royal; Terence J. Ward, and Albert Opalko, both of Maidenhead, all of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

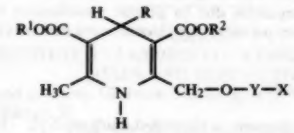
Filed Jul. 30, 1985, Ser. No. 760,705

Claims priority, application United Kingdom, Aug. 17, 1984, 8421039

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—332 11 Claims

1. A method for treating or preventing diseases responsive to inhibition of blood platelet aggregation or thromboxane synthetase in a mammal in need thereof which comprises administering to said mammal an amount effective to inhibit blood platelet aggregation or thromboxane synthetase of a compound of formula I



(I)

wherein

R is phenyl or optionally substituted phenyl;

R^1 and R^2 are each independently C_1–C_4 alkyl or 2-methoxyethyl;

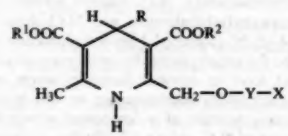
Y is $—(CH_2)_n—$, $—CH_2CH(CH_3)—$ or $—CH_2C(CH_3)_2—$;

X is a 5 or 6 membered nitrogen containing aromatic heterocyclic ring optionally substituted by one or more C_1–C_4 alkyl, phenyl, benzyl, CN, $—N(R^3)_2$, $(CH_2)_mCO_2H$, $(CH_2)_mCO_2(C_1$–C_4 alkyl) or $(CH_2)_mCON(R^3)_2$ groups wherein each R^3 is independently H or C_1–C_4 alkyl and m is 0 or 1;

and

n is 1 to 3 when X is linked by a ring carbon atom or 2 or 3 when X is linked by a ring nitrogen atom; and their pharmaceutically acceptable acid addition salts.

8. A method for treating or preventing inflammatory or allergic conditions reponsive to inhibition of phosphilipase A_2 in a mammal in need thereof, which comprises adminstering to said mammal an amount effective to inhibit phosphilipase A_2 of a compound of formula Ia



(Ia)

wherein

R is 2-nitrophenyl;

R^1 and R^2 are each independently C_1–C_4 alkyl or 2-methoxyethyl;

Y is $—(CH_2)_n—$, $—CH_2CH(CH_3)—$ or $—CH_2C(CH_3)_2—$;

X is a 5 or 6 membered nitrogen containing aromatic heterocyclic ring optionally substituted by one or more C_1–C_4 alkyl, phenyl, benzyl, CN, $—N(R^3)_2$, $(CH_2)_mCO_2H$, $(CH_2)_mCO_2H$, $(CH_2)_mCO_2(C_1$–C_4 alkyl) or $(CH_2)_mCON(R^3)_2$ groups wherein each R^3 is independently H or C_1–C_4 alkyl and m is 0 or 1;

and

n is 1 to 3 when X is linked by a ring carbon atom or 2 or 3 when X is linked by a ring nitrogen atom; or a pharmaceutically acceptable acid addition salts thereof.

4,694,013
INSECTICIDAL AND ACARICIDAL PHENOXYPYRDINYL ESTERS AND INTERMEDIATES

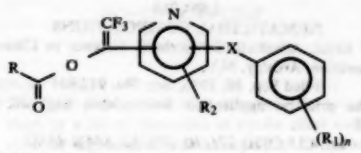
George P. Lahm, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 796,152, Nov. 8, 1985, abandoned. This application Sep. 26, 1986, Ser. No. 910,942

Int. Cl.[4] A61K *31/44*; C07D *213/61, 213/62*

U.S. Cl. 514—345 53 Claims

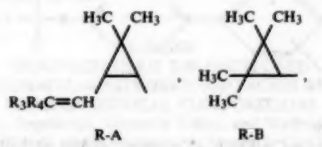
1. A phenoxypyridinyl compound of the formula



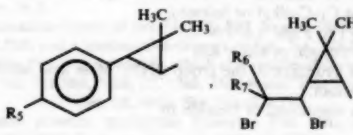
I

including all geometric and stereoisomers or mixtures thereof characterized by a 1,3-relationship between the ester and the ether substituents on the pyridine ring, wherein:

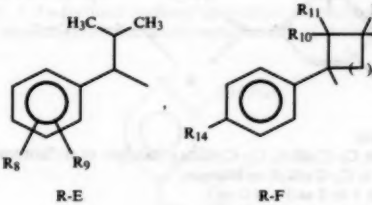
R is



R-A R-B



R-C R-D



R-E R-F

X is O or S;

n is 1 to 3;

m is 0 or 1;

R_1 is H, C_1 to C_4 alkyl, C_2 to C_5 alkenyl, C_2 to C_5 alkynyl, C_1 to C_4 haloalkyl, C_1 to C_4 alkoxy, C_1 to C_4 haloalkoxy, C_1 to C_4 alkylthio, C_1 to C_4 alkylsulfinyl, C_1 to C_4 alkylsulfonyl, C_1 to C_4 haloalkylthio, C_1 to C_4 haloalkylsulfonyl, F, Cl, Br; when n=2, the R_1 substituents, taken together, can be 3,4-methylenedioxy;

R_2 is H, F, Cl, Br, CH_3, or CF_3;

R_3 is F, Cl, Br, C_1 to C_4 alkyl, C_1 to C_4 haloalkyl, CO_2CH_3, or $CO_2CH_2CH_3$;

R_4 is F, Cl, Br, or CH_3;

R_5 is H, F, Cl, CF_3, or C_1 to C_4 alkyl;

R_6 is Cl or Br;

R_7 is Cl or Br;

R_8 is H, C_1 to C_4 alkyl, C_1 to C_4 haloalkyl, C_1 to C_4 alkoxy, C_1 to C_4 alkylthio, C_1 to C_4 alkylsulfinyl, C_1 to C_4 alkylsulfonyl, C_1 to C_4 haloalkylthio, C_1 to C_4 haloalkylsulfinyl, C_1 to C_4 haloalkylsulfonyl, F, Cl or Br;

R_9 is H, F, Cl, CH_3, OCH_3, or R_8 and R_9, taken together, can be 3,4-methylenedioxy;

R_{10}, R_{11}, R_{12} and R_{13} are independently H, F, or Cl; and

R_{14} is H, F, Cl, OCH_3, OCH_2CH_3, or C_1 to C_2 haloalkoxy.

40. A method for controlling acarides or insects that comprises applying to the pest or to the environment of the acaride or insect an insecticidally and acaricidally effective amount of a compound according to claim 1.

4,694,014
NEMATICIDAL COMPOSITIONS

Beriger Ernst, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

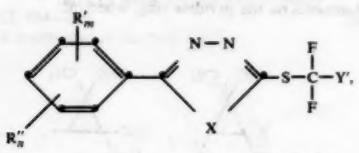
Filed Sep. 26, 1986, Ser. No. 912,904

Claims priority, application Switzerland, Sep. 30, 1985, 4214/85

Int. Cl.[4] **C07D** *271/10, 285/10;* **A01N** *43/82*

U.S. Cl. 514—363 **16 Claims**

1. A compound of formula Ia



(Ia)

wherein

R′ is C_1–C_5alkyl, C_1–C_5alkoxy, halogen or trifluoromethyl,

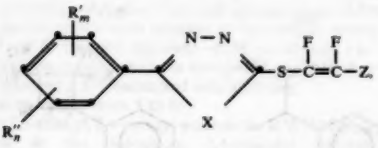
R″ is C_1–C_5alkyl or halogen,

m is 1 to 3 and n is 0 or 1,

X is oxygen or sulfur and

Y′ is hydrogen or the group CHF_2, or an acid addition salt thereof.

2. A compound of formula Ib



(Ib)

wherein

R′ is C_1–C_5alkyl, C_1–C_5alkoxy, halogen or trifluoromethyl,

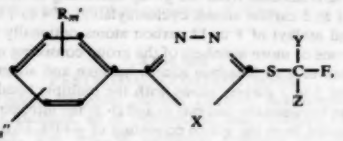
R″ is C_1–C_5alkyl or halogen,

m is 1 to 3 and n is 0 or 1,

X is oxygen or sulfur and

Z is fluorine or trifluoromethyl, or an acid addition salt thereof.

3. A compound of formula I*



(I*)

wherein

R′ is C_1–C_5alkyl, C_1–C_5alkoxy, halogen or trifluoromethyl,

R″ is C_1–C_5alkyl or halogen,

m is 1 to 3 and n is 0 or 1,

X is oxygen or sulfur,

Y is hydrogen, fluorine, trifluoromethyl or the group HC(F)Z and

Z is fluorine or trifluoromethyl, or an acid addition salt thereof.

4,694,015
PHARMACEUTICAL OR VETERINARY COMPOSITIONS CONTAINING THIOSULFONATE DERIVATIVES

Bernard Sebille, Clamart; Yves Beuzard, Paris, and Henri Demarne, Montpellier, all of France, assignors to Sanofi and Institut National de la Sante et de la Recherche Medicale (Inserm), both of Paris, France

Filed Nov. 13, 1985, Ser. No. 797,486

Claims priority, application France, Nov. 13, 1984, 84 17286

Int. Cl.[4] **A61K** *31/42, 31/415*

U.S. Cl. 514—375 **16 Claims**

1. A pharmaceutical or veterinary composition for treating drepanocytosis, malaria or babebiosis, which comprises an effective amount for inhibiting the malformation or destruction of red blood corpuscles due to genetic modification of the haemoglobin or to parasites of a thiosulfonate derivative having a formula:

$$R—S—SO_2—R_1$$

in which R represents a 1-methyl-imidazol-2-yl, 1H-benzimidazol-2-yl or benzoxazol-2-yl radical and R_1 represents a lower alkyl, (hydroxy)lower alkyl, lower alkanoyl, phenyl, (lower alkyl)phenyl, (hydroxy lower alkyl)phenyl, (lower alkanoyl)phenyl or quinolin-8-yl radical, in association with a pharmaceutical carrier or excipient therefor, and wherein said composition is in the form of a coated or uncoated tablet, a hard- or soft-gelatin capsule, a suspension or a syrup for oral administration, a suppository for rectal administration, a sterile solution or suspension for parenteral administration.

4,694,016
PHTHALAMIDE DERIVATIVES WITH ANTHELMINTIC ACTIVITY

Jing-Jong Lu, and Herbert L. Wehrmeister, both of Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Oct. 18, 1985, Ser. No. 788,935

Int. Cl.[4] **A61K** *31/42;* **C07D** *261/04*

U.S. Cl. 514—380 **4 Claims**

1. An anthelmintic compound selected from the group consisting of N-(3-chloro-4,5-dihydro-isoxazol-4-yl)-N′-(m-methylbenzyl)phthalamide, N-(3-chloro-4,5-dihydro-isoxazol-4-yl)-N′-(p-tolylethyl)phthalamide, and N-(3-chloro-4,5-dihydro-isoxazol-4-yl)-N′-(3-phenyl-1-propyl)phthalamide.

2. A method for prophylactically or therapeutically treating mammals and fowl to combat parasitic worm infestations which comprises orally administering to said mammals and fowl an effective amount of a compound selected from the group consisting of N-(3-chloro-4,5-dihydro-isoxazol-4-yl)-N′-(m-methylbenzyl)phthalamide, N-(3-chloro-4,5-dihydro-isox-

azol-4-yl)-N'-(p-tolylethyl)phthalamide, and N-(3-chloro-4,5-dihydro-isoxazol-4-yl)-N'-(3-phenyl-1-propyl)phthalamide.

4,694,017

2-AMIDO 3(OXINDOL-3-YL)PROPIONIC ACIDS HAVING ANTIULCER ACTIVITY

Minoru Uchida, Komatsushima; Makoto Komatsu, and Kazuyuki Nakagawa, both of Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

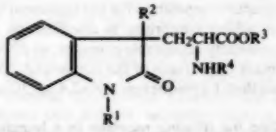
Filed May 15, 1984, Ser. No. 610,574

Claims priority, application Japan, May 19, 1983, 58-88948; Jan. 18, 1984, 59-7606

Int. Cl.[4] A61K *31/405*; C07D *209/34*

U.S. Cl. 514—418 **24 Claims**

1. Oxindole compounds and pharmaceutically acceptable salts thereof represented by the formula:



wherein R^1 is a hydrogen atom, a lower alkyl group, a lower alkenyl group, a lower alkynyl group or a phenyl-lower alkyl group; R^2 is a hydrogen atom or a lower alkyl group; R^3 is a hydrogen atom or a lower alkyl group; R^4 is a cycloalkylcarbonyl group, a benzoyl group which may have 1 to 3 substituents selected from the group consisting of a halogen atom, a lower alkyl group and a lower alkoxy group on the phenyl ring, or a phenyllower alkanoyl group which may have halogen atoms as the substituents on the phenyl ring.

4,694,018

SUBSTITUTED 1,5-DIPHENYL-2-PYRROLEPROPIONIC ACIDS AND DERIVATIVES

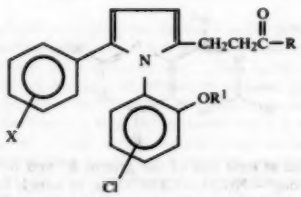
Leland J. Chinn, Glenview, Ill., assignor to G. D. Serale & Co., Chicago, Ill.

Filed Nov. 29, 1985, Ser. No. 802,885

Int. Cl.[4] C07D *207/337*; A61K *31/40*

U.S. Cl. 514—427 **12 Claims**

1. A compound of the formula:



and the pharmaceutically acceptable base salts thereof wherein

R represents hydroxy, alkoxy of from 1 to 6 carbon atoms, inclusive, or amino:

R^1 represents hydrogen or acyl of from 2 to 7 carbon atoms, inclusive; and

X represents hydrogen, halogen, hydroxy, or alkoxy of from 1 to 6 carbon atoms, inclusive.

9. A method of eliciting an anti-inflmmatory or anti-allergic effect in a mammal in need thereof comprising administering thereto a therapeutically effective amount of a compound according to claim 1.

10. A method of treating asthma in a mammal in need thereof comprising administering thereto a therapeutically effective amount of a compound according to claim 1.

11. A method of treating psoriasis in a mammal in need thereof comprising administering thereto a therapeutically effective amount of a compound according to claim 1.

4,694,019

THERAPEUTICA COMPOSITIONS CONTAINING DERIVATIVES OF, ACRYLIC ACID HAVING AN OXYGEN-CONTAINING HETEROCYCLE, THERAPEUTIC TREATMENT THEREWITH AND NEW COMPOUNDS

Mario Bianchi, deceased, late of Carate Brianza (by Elsa de Carli, Silvana Bianchi and Giovanni Bianchi, Legal Representatives), and Fernando Barzaghi, Monza, all of Italy, assignors to Roussel UCLAF, Paris, France

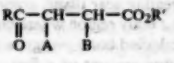
Continuation-in-part of Ser. No. 572,458, Jan. 20, 1984, abandoned. This application Aug. 14, 1985, Ser. No. 765,539

Claims priority, application Italy, Jan. 24, 1983, 19249 A/83; Aug. 25, 1983, 22647 A/83

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—461 **5 Claims**

1. A method for the treatment of a patient suffering from hyperchlorhydria, gastric and gastroduodenal ulcers, gastritis, hiatus hernia and gastric and gastroduedenal ailments accompanied by gastric hyperacidity, comprising administering to said patient a gastric antisecretory and cytoprotective effective amount of a compound of the formula



(I)

in which

R is a furyl radical, possibly substituted, R' is a hydrogen atom or a linear, branched or cyclic alkyl radical, saturated or unsaturated, containing up to 18 carbon atoms, and,

either A represents a hydrogen atom and B represents a hydroxyl radical or A and B together form a carbon-carbon double bond,

or a pharmaceutically acceptable alkaline, alkaline-earth or amine salt thereof.

4,694,020

DERIVATIVES OF 2-(SUBSTITUTED SULFAMYL)-6-NITROBENZOIC ACIDS AND PHARMACEUTICAL COMPOSITIONS

Edward L. Engelhardt, Gwynedd Valley, and Walfred S. Saari, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

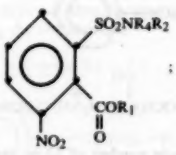
Continuation-in-part of Ser. No. 795,569, Nov. 6, 1985, Pat. No. 4,647,588, and a continuation-in-part of Ser. No. 795,564, Nov. 6, 1985, Pat. No. 4,654,369, which is a continuation-in-part of Ser. No. 716,886, Mar. 27, 1985, abandoned. This application Oct. 21, 1986, Ser. No. 921,718

Claims priority, application European Pat. Off., Mar. 20, 1986, 86103792.7; Japan, Mar. 27, 1986, 61-67425

Int. Cl.[4] A61K *31/24*; C07C *143/78*

U.S. Cl. 514—535 **5 Claims**

1. A 2-substituted sulfamyl derivative of 6-nitrobenzamide, or physiologically acceptable salts thereof, of the formula



wherein

R_1 is lower alkyl, or lower alkyl substituted with hydroxyl;

R_2 is lower alkyl substituted with

R_3 is hydrogen, lower alkyl, or lower alkyl substituted with hydroxyl; and

R_4 is H or hydroxy lower alkyl.

5. A pharmaceutical composition for enhancing the therapeutic effect of radiation which consists of an effective amount of a compound defined in claim 1 or 2 or 3 or 4, or mixtures thereof, and a non-toxic pharmaceutically acceptable carrier.

4,694,021

METHOD FOR TOPICAL TREATMENT OF SCAR TISSUE

Raymond H. Schweiger, 363 S. Bonsal St., Baltimore, Md. 21224

Filed May 5, 1986, Ser. No. 859,816

Int. Cl.[4] A61K *31/235*

U.S. Cl. 514—544 **13 Claims**

1. A method for treating scar tissue, comprising the step of topically applying, to a body region where cutaneous or subcutaneous scarring or calcified bone overgrowth has occurred, a therapeutically effective amount of a first composition comprising an argillaceous absorbent, at least one ester of p-hydroxybenzoic acid, urea, and a sulfosuccinate compound.

4,694,022

FATTY ACID SALTS OF BETAXOLOL USEFUL IN THE TREATMENT OF GLAUCOMA

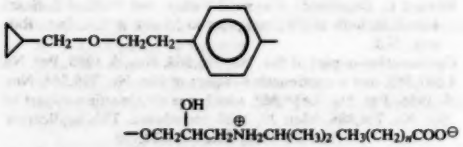
Steven H. Gerson, and Wesley W. Han, both of Fort Worth, Tex., assignors to Alcon Laboratories, Inc., Forth Worth, Tex.

Filed Dec. 24, 1986, Ser. No. 946,345

Int. Cl.[4] C11C *3/00;* **A61K** *31/045, 31/085*

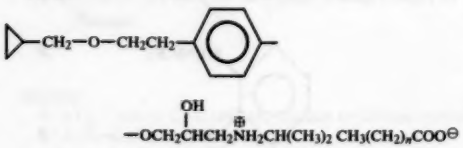
U.S. Cl. 514—554 **6 Claims**

1. A compound of formula:



herein n is a whole number of 10 or greater.

6. A topical, ophthalmic composition comprising a compound of formula:



wherein n is a whole number of 10 or greater, in an amount effective to treat glaucoma by reducing intraocular pressure; and an aqueous, pharmaceutically acceptable, ophthalmic vehicle therefor.

4,694,023

ALPHA-ALKYL POLYOLEFINIC CARBOXYLIC ACIDS AND DERIVATIVES THEREOF USEFUL IN THE TREATMENT OF PSORIASIS AND ALLERGIC RESPONSES

Bernard Loev, Scarsdale; Wan-kit Chan, Yorktown Heights, both of N.Y., and Howard Jones, Holmdel, N.J., assignors to USV Pharmaceutical Corporation, Fort Washington, Pa.

Continuation-in-part of Ser. No. 511,822, Jul. 8, 1983, Pat. No. 4,505,930, which is a continuation-in-part of Ser. No. 392,837, Jun. 28, 1982, Pat. No. 4,472,430. This application Mar. 11, 1985, Ser. No. 710,768

The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.

Int. Cl.[4] A61K *31/20;* **C07C** *57/03*

U.S. Cl. 514—559 **3 Claims**

1. 2,5,9-trimethyl-11-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4,6,8,10-undecapentaenoic acid.

2. A therapeutic composition for the treatment of psoriasis in a human host which comprises, in combination with at least one pharmaceutically acceptable extender, an effective amount for the treatment of psoriasis of the compound 2,5,9-trimethyl-11-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4,6,8,10-undecapentaenoic acid.

3. A method for treating psoriasis in a human host which comprises administering to said host a therapeutically effective amount for the treatment of psoriasis of the compound 2,5,9-trimethyl-11-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4,6,8,10-undecapentaenoic acid.

4,694,024

COMBINATION PRODUCT COMPOSED OF PYRIMIDO-PYRIMIDINES AND O-ACETYLSALICYLIC ACID OR ITS PHARMACOLOGICALLY TOLERATED SALTS, AND ITS USE

Klaus U. Weithmann, Hofheim am Taunus, and Dirk Seiffge, Münzenberg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 19, 1985, Ser. No. 756,674

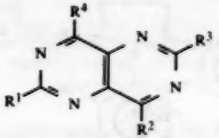
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1984, 3426961; May 3, 1985, 3515874

Int. Cl.[4] A61K *31/62*

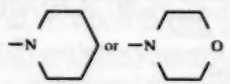
U.S. Cl. 514—161 **18 Claims**

1. A pharmaceutical combination composition containing as essential ingredients:

(a) a pyrimido-pyrimidine of the Formula I



wherein at least one of the groups R^1 and R^3 represents the group $-N(CH_2-CHR^5OH)_2$ in which R^5 is hydrogen or methyl and at least one of the groups R^2 and R^4 is the group



or an effective metabolite or salt or combination thereof and

(b) O-acetylsalicylic acid or a pharmaceutically tolerable salt thereof, the weight ratio between component (a) and component (b) being higher than 0.5 and at most 30,

(c) together with or without a pharmaceutical carrier, for the consecutive application in the therapy of diseases which are caused or characterized by impaired blood functions or blood ingredients, such that component (a) is at first released.

4,694,025

ALCOHOL CONTROL OF LIGHTLY CROSSLINKED FOAMED POLYMER PRODUCTION

Chung P. Park, Pickerington, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 16, 1984, Ser. No. 672,010
Int. Cl.[4] C08J 9/14
U.S. Cl. 521—88 13 Claims

1. A process for preparing lightly crosslinked olefin or styrene polymer foamed articles having a closed-cell structure, comprising the steps of:

(a) providing an olefin or styrene polymer material,

(b) admixing said olefinic or styrenic polymer material with (1) a blowing agent, (2) a crosslinking agent selected from the group consisting of silane, azido silane, titanate and amino compounds which upon reaction with said olefin or styrene polymer material reversibly releases alcohol, and (3) additionally admixing a sufficient amount of alcohol to control the degree of crosslinking of said olefin or styrene polymer material in the admixture which is thereby formed, and

(c) extruding said admixture and activating said blowing agent in such a manner to expand said olefin or styrene polymer material to a cellular structure and at the same time dissipate said alcohol, whereby foaming and crosslinking of said olefin or styrene polymer material concurrently takes place.

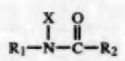
4,694,026

POLYOLEFIN FOAM COMPOSITIONS HAVING IMPROVED DIMENSIONAL STABILITY UTILIZING CERTAIN UNSATURATED NITROGEN-CONTAINING COMPOUNDS AND PROCESS FOR MAKING SAME

Chung P. Park, Pickerington, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

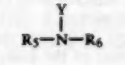
Filed May 24, 1985, Ser. No. 737,598
Int. Cl.[4] C08J 9/14
U.S. Cl. 521—94 21 Claims

1. A process for dimensionally stabilizing low density foamed polyolefins comprising expanding an olefin polymer under foaming conditions in the presence of a stabilizing amount of a nitrogen-containing compound selected from the group consisting of the compounds of formulas (I) and (II):



I

wherein: R_1 is (a) an alkyl group having 9 to 23 carbon atoms, (b) a hydrocarbon residue of a saturated fatty acid having 9 to 23 carbon atoms, (c) a saturated acyl group having 10 to 24 carbon atoms, (d) a saturated substituent organic group containing a subgroup of the formula $-(R_3O)_m-$ wherein R_3 is an alkylene group having 1 to 5 carbon atoms and m is an integer from 1 to 10, (e) an unsaturated organic group having 9 to 23 carbon atoms, (f) a hydrocarbon residue of an unsaturated fatty acid having from 9 to 23 carbon atoms, (g) an unsaturated acyl group having 10 to 24 carbon atoms, or (h) an unsaturated substituent organic group containing a subgroup of the formula $-(R_4O)_m-$ wherein R_4 is an alkylene group having 1 to 5 carbon atoms and m is an integer from 1 to 10, R_2 is a, b, c or d when R_1 is e, f, g or h and R_2 is e, f, g or h when R_1 is a, b, c, or d; and X is a hydrogen atom, an alkyl group having 1 to 24 carbon atoms, an unsaturated organic group having from 2 to 23 carbon atoms, b, c, d, f, g, or h;



II

wherein R_5 is a, b, c or d, R_6 is e, f, g or h, and Y is an hydrogen atom, an alkyl group having from 1 to 24 carbon atoms, an unsaturated organic group having from 2 to 23 carbon atoms, b, d, f or h.

4,694,027

EXPANDABLE POLYOLEFIN COMPOSITIONS AND PREPARATION PROCESS UTILIZING ISOBUTANE BLOWING AGENT

Chung P. Park, Pickerington, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 24, 1985, Ser. No. 813,315
Int. Cl.[4] C08J 9/14
U.S. Cl. 521—94 4 Claims

1. A process for preparing a substantially closed cell olefin polymer foam having dimensional stability comprising the steps of:

(a) heat plastifying an olefin polymer resin selected from the group consisting of homopolymers of ethylene and copolymers of ethylene and a copolymerizable monomer,

(b) admixing said heat plastified resin with (1) a stability control agent selected from the group consisting of partial esters of long chain fatty acids with polyols, higher alkyl amines, fatty acid amides, olefinically unsaturated carboxylic acid copolymers, and polystyrene and (2) a blowing agent selected from the group consisting of (i) isobutane, (ii) a mixture of from 5%–95% isobutane on a molar basis with from 95%–5% of a physical blowing agent selected from the group consisting of chlorofluorocarbons and fluorocarbons having from 1 to 4 carbon atoms, boiling points between −50° and 50° C., and a permeation rate through said olefin polymer resin modified with said stability control agent or less than about 1.2 times the permeation rate of air, and (iii) a mixture of at least 70% isobutane with a physical blowing agent selected from the group consisting of hydrocarbons, chlorocarbons, and chlorofluorocarbons having from 1 to 5 carbon atoms, boiling points between −50° C. and 50° C., and a permeation rate through said olefin polymer resin modified with said stability control agent of greater than about 1.2 times the permeation rate of air, and

(c) activating said blowing agent to expand said admixture to a substantially closed-cell olefin polymer foam.

4,694,028

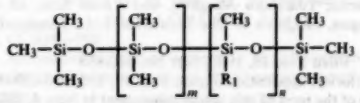
MANUFACTURING METHOD FOR PHENOL RESIN FOAM

Yukio Saeki; Naomitsu Inoue, and Yukio Tokunaga, all of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Apr. 5, 1986, Ser. No. 859,670
Int. Cl.[4] C08V 9/14
U.S. Cl. 521—110 10 Claims

1. A method for the manufacturing of phenol resin foam comprising foaming and curing a resole phenolic resin having a number average molecular weight of 150–400, surface active agents, blowing agents, and curing agents, wherein surface active agents are selected from each of the general formulas A and B and may be one or more types of each represented by

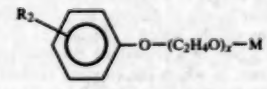
(A)



where R_1 is a saturated aliphatic hydrocarbon group of 8–14 carbon atoms and/or a 2-phenylpropyl group, m and n are integers meeting the requirement:

$$\frac{n}{n+m} = 0.2 - 0.9,$$

(B)



where R_2 is a saturated aliphatic hydrocarbon group of 4–12 carbon atoms, M is a hydrogen atom or $-SO_2Na$, X is an

integer of 4–110, and the amount of surface active agent A used is 0.1–10 parts by weight, and surface active agent B used is 0.1–10 parts by weight based on the weight of the resole phenolic resin.

4,694,029

HYBRID PHOTOCURE SYSTEM

John M. Land, Kansas City, Mo., assignor to Cook Paint and Varnish Company, Kansas City, Mo.

Filed Apr. 9, 1985, Ser. No. 721,295

Int. Cl.[4] C08F 2/50; C08G 59/62, 59/68, 59/72

U.S. Cl. 522—8 **9 Claims**

1. A photopolymerizable composition comprising

(a) a polymerizable epoxy-containing material,

(b) a polymerizable monomer or monomers selected from the group consisting of ethylenglycol diacrylate, hexane-1,6-diol diacrylate, propoxylated bisphenol A diacrylate, propoxylated bisphenol A dimethacrylate, trimethylolpropane diacrylate, pentaerythritol triacrylate, pentaerythritol trimethacrylate, trimethylolpropane triacrylate, trimethylolpropane trimethacrylate, hexane-1,6-diol dimethacrylate, 1,3-butylene glycol dimethacrylate, diethylene glycol diacrylate, neopentyl glycol diacrylate, pentaerythritol tetraacrylate and polyethylene glycol diacrylate,

(c) an effective amount of, as a cationic photoinitiator, an aromatic sulfonium compound or an aryliodonium salt,

(d) an effective amount of a carbonyl type photoinitiator which is capable of photodecomposing to free radicals in the presence of UV light and

(e) tetrahydrofurfuryl alcohol as an accelerator,

wherein the number of epoxy equivalents ranges from 14 to 1.2 per accelerator equivalent.

4,694,030

INTUMESCENT POLYSILOXANE MOLDING COMPOSITIONS

Wulf von Bonin, Leverkusen; Hans Sattlegger, Odenthal, and Harold Ebneth, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 16, 1987, Ser. No. 3,999

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1986, 3602888

Int. Cl.[4] C09K 21/14

U.S. Cl. 523—179 **6 Claims**

1. An intumescent polysiloxane molding composition, comprising a polysiloxane molding composition and an expandable graphite compound.

4,694,031

SURFACE TREATED-GLASS FIBER-REINFORCED POLYPROPYLENE COMPOSITION

Hideyo Morita; Tomohiko Akagawa, and Yasuo Kita, all of Sakai, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Feb. 18, 1986, Ser. No. 830,655

Claims priority, application Japan, Feb. 19, 1985, 60-029356

The portion of the term of this patent subsequent to Nov. 4, 2003, has been disclaimed.

Int. Cl.[4] C08K 9/06

U.S. Cl. 523—203 **8 Claims**

1. A glass fiber-reinforced polypropylene composition, which comprises, based on the total weight of the composition:

(A) 99 to 40% by weight of a modified ethylene/propylene block copolymer having an itaconic anhydride content of at least 0.5% by weight, which is obtained by graft-modifying at least a part of a crystalline ethylene/propylene block copolymer, in which the ethylene content is 3 to 15% by weight, the melt flow rate is 0.1 to 70 g/10 min., the intrinsic viscosity of the portion soluble in p-xylene at normal temperature is 2.5 to 6 as measured in decalin at 135°C. and the ethylene content of the portion insoluble in p-xylene at normal temperature is 1.5 to 10% by weight, with itaconic anhydride and an organic peroxide in an extruder,

(B) 0 to 20% by weight of a polyolefin rubber, and

(C) 1 to 45% by weight of a surface-treated glass fiber.

4,694,032

PROCESS FOR PREPARING THERMOPLASTIC RESIN COMPOSITION

Osamu Kakimoto, Himeji, and Fumiya Nagoshi, Kobe, both of Japan, assignors to Kanegaguchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 7, 1985, Ser. No. 795,778

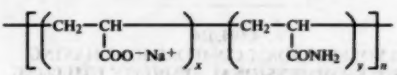
Claims priority, application Japan, Nov. 8, 1984, 59-235627

Int. Cl.[4] C08K 5/19, 5/20

U.S. Cl. 523—334 **7 Claims**

1. A process for preparing a thermoplastic resin composition capable of giving delustered articles which comprises blending (A) 10 to 30 parts by weight of a graft-copolymer and (B) 90 to 70 parts by weight of a polymer, the total amount of the components (A) and (B) being 100 parts by weight;

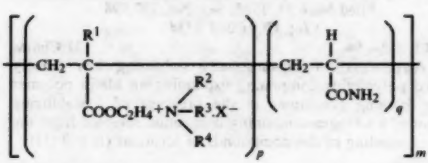
said graft-copolymer (A) being prepared by adding at least one polymer coagulant selected from the group consisting of a coagulant having the formula (I):



(I)

wherein x is 0 to 5% by mole, y is 100 to 95% by mole and n is an integer which gives a molecular weight of 1,000 to 13,000,000,

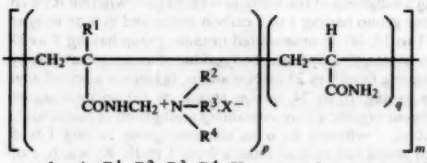
a coagulant having the formula (II):



(II)

wherein R^1 is hydrogen atom or methyl group, R^2 is hydrogen atom or a lower alkyl group having 1 or 2 carbon atoms, R^3 and R^4 are same or different and each is a lower alkyl group having 1 or 2 carbon atoms, X is a counter anion, p is 2 to 100% by mole, q is 98 to 0% by mole and m is an integer which gives a molecular weight of 200 to 6,000,000, and

a coagulant having the formula (III):



(III)

wherein R^1, R^2, R^3, R^4, X, p, q and m are as defined above, to (1) 70 to 95 parts by weight (solid content) of a latex of a diene rubber having a diene content of more than 50% by weight to give a coagulated diene rubber, and then graft-polymerizing (2) 30 to 5 parts by weight of at least one monomer selected from the group consisting of a vinyl aromatic monomer, a vinyl cyanide monomer and a methacrylic acid ester onto the coagulated diene rubber, the total amount of the components (1) and (2) being 100 parts by weight, and the amount of said polymer coagulant being from 0.01 to 0.5 part by weight per 100 parts by weight of the total amount of the components (1) and (2);

said polymer (B) being prepared by polymerizing at least one monomer selected from the group consisting of an aromatic vinyl monomer, a vinyl cyanide monomer, an acrylic acid ester and a methacrylic acid ester.

4,694,033

RESIN COMPOSITION AND PROCESS FOR THE PREPARATION OF THIS RESIN COMPOSITION

Robert van der Linde, Zwolle, Netherlands, assignor to DSM Resins B.V., Zwolle, Netherlands

Continuation-in-part of Ser. No. 762,325, Aug. 5, 1985. This application Feb. 7, 1986, Ser. No. 826,976

Claims priority, application Netherlands, Aug. 9, 1984, 8402455; Dec. 7, 1985, 8503379; Feb. 4, 1986, 8600266

Int. Cl.[4] C08G *63/54, 63/48, 59/00, 63/00*

U.S. Cl. 523—437 23 Claims

1. A resin composition comprising a pre-reacted mixture of at least two resins, wherein the first resin consists of the reaction product of an epoxidized fatty acid ester of a polyvalent alcohol with a carboxylic acid and the second resin consists of an aliphatic carboxylic acid-modified ester of an aliphatic polyvalent alcohol, and wherein said first and second resins have been mixed for a sufficient time and at a temperature such that a partial pre-reaction therebetween takes place.

4,694,034

SIZE COMPOSITION

David F. Lewin, Amarillo, Tex., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 29, 1986, Ser. No. 868,382

Int. Cl.[4] C08K *3/20*

U.S. Cl. 523—503 7 Claims

1. A substantially chrome-free aqueous sizing composition for glass fiber gun roving which comprises (A) a mixture of emulsified film-forming polymers comprising a polymer of vinyl acetate and ethylene, a polymer of vinyl acetate and an epoxy-functional vinyl monomer, and an unsaturated polyester resin; (B) titanium acetyl acetonate; (C) quaternary salt of ammonium ethosulfate; (D) a cationic lubricant; and (E) 3-methacryloxypropyltrimethoxysilane or hydrolysate thereof.

4,694,035

PROCESS FOR PREPARING LARGE-SIZED POLYMER PARTICLES

Kiyoshi Kasai, Yokkaichi; Masayuki Hattori, Aichi; Osamu Kikuchi, Yokkaichi; Hiromi Takeuchi, Yokohama; Haruhiro Hirai, Mie, and Nobuo Sakurai, Yokohama, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Jan. 27, 1986, Ser. No. 823,013

Claims priority, application Japan, Jan. 30, 1985, 60-14460; Jun. 10, 1985, 60-124266; Aug. 22, 1985, 60-183084

Int. Cl.[4] C08F *2/18*

U.S. Cl. 524—458 12 Claims

1. A process for preparing large-sized polymer particles having a particular diameter in the range of 0.1 to 500 μm by seed polymerization, comprising:

(a) preparing a dispersion of finely dispersed polymerizable monomer by dispersing a monomer in an aqueous medium so that the number average particle diameter of the resulting monomer droplets is not larger than 0.8 μm and not larger than the number average particle diameter of seed particles in a dispersion of seed particles and so that the relationship of the number average particle diameter, Dm, of said monomer droplets in a semistable condition in the monomer dispersion and the desired number average particle diameter, D, of the final polymer particles produced upon polymerization of the monomer, satisifies the expression:

$$0.5 \times D < Dm < 3.5 \times D;$$

(b) combining said monomer dispersion with said dispersion of seed particles in order to absorb or adsorb the polymerizable monomer on the seed particles; and

(c) polymerizing the polymerizable monomer in the presence of a polymerization initiator.

4,694,036

METAL DIFFUSION AND USE

Alfonso L. Baldi, Wynnewood, Pa., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

Filed Jun. 23, 1983, Ser. No. 507,174

Int. Cl.[4] C08K *5/02*

U.S. Cl. 524—473 2 Claims

1. A solution in which heavy metal particles are readily suspended, the solvent of said solution comprising methyl chloroform or methylene chloride, and in the solvent are dissolved from about 2 to about 8% acrylic resin binder and from about 0.1 to about 1% of an ethylene acrylic acid copolymer dispersing aid having a hydrocarbon chain of from 12 to 50 carbons.

4,694,037

COPOLYMERS OF POLY(VINYL TRIFLUOROACETATE) OR POLY(VINYL ALCOHOL)

Ronald F. Ofstead, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 500,785, Jun. 3, 1983, Pat. No. 4,528,325. This application Mar. 15, 1985, Ser. No. 712,353

Int. Cl.[4] C08L *29/04*

U.S. Cl. 524—557 9 Claims

1. A process for preparing a polymer hydrogel comprising the steps:

a. admixing

(1) 95 to 99.99 weight percent of vinyl trifluoroacetate monomer, and

(2) 0.01 to 5 weight percent of a comonomer selected from vinyl esters, vinyl ethers, and copolymerizable disubstituted ethylenes,

b. allowing said admixture to react so as to form a poly(vinyl trifluoroacetate) copolymer, and

c. solvolyzing said poly(vinyl trifluoroacetate) copolymer in a mild base in a non-aqueous diluent so as to produce a poly(vinyl alcohol) copolymer, said base in a non-aqueous diluent being selected so that the poly(vinyl trifluoroacetate) copolymer and the copolymeric poly(vinyl alcohol) solvolysis product are insoluble therein, and

d. hydrating said poly(vinyl alcohol) copolymer in water or normal saline to produce said polymer hydrogel.

4,694,038

LOW FRICTION, LOW WEAR COATING AND PAINT FOR RUBBER

Robert A. Burns, Seattle, and Jan W. VanWyk, Kirkland, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 20, 1986, Ser. No. 920,628

Int. Cl.[4] C08K *7/00, 3/04*

U.S. Cl. 524—590 5 Claims

1. An enamel consisting essentially of polyurethane enamel paint filled with between about 20–40 wt. % amorphous flake graphite.

4,694,039

STABILIZED LACTAM POLYMERIZATION SOLUTIONS

Edward H. Mottus, Ballwin; Ross M. Hedrick, and Bernard Silverman, both of St. Louis, all of Mo., assignors to DSM Rim Nylon V.O.F., Geleen, Netherlands

Division of Ser. No. 844,405, Mar. 26, 1986, Pat. No. 4,672,085. This application Nov. 6, 1986, Ser. No. 927,595

Int. Cl.[4] C08K *5/21*

U.S. Cl. 524—718 16 Claims

1. A composition comprising:

a lactam monomer; and

an unsaturated oligomer and a stabilizing amount of a trisubstituted urea, wherein the unsaturated oligomer is a polymer of an alkadiene having at least 4 carbons and has pendant thereto at least one group selected from the group consisting of hydroxy, amine, epoxy, acyllactam, and acyllactam precursor groups.

4,694,040

LIQUID COMPOSITION FOR FORMING A COATING FILM OF ORGANOPOLYSILOXANE AND METHOD FOR THE PREPARATION THEREOF

Akira Hashimoto, Yokohama; Toshihiro Nishimura, Kawasaki; Muneo Nakayama, Tokyo; Hisashi Nakane, Kawasaki, and Shozo Toda, Chigasaki, all of Japan, assignors to Tokyo Denshi Kagaku Kabushiki Kaisha, Kanagawa, Japan

Continuation of Ser. No. 756,612, Jul. 9, 1985, abandoned, which is a continuation of Ser. No. 576,617, Feb. 3, 1984, abandoned, which is a continuation of Ser. No. 420,620, Sep. 21, 1982, abandoned. This application Aug. 25, 1986, Ser. No. 902,029

Claims priority, application Japan, Dec. 7, 1981, 56-196532

Int. Cl.[4] C08K *5/05*

U.S. Cl. 524—765 **8 Claims**

1. An organic liquid solution for forming a heat resistant organopolysiloxane film on a surface, said solution containing from about 10 to 70% by weight of an oligomer formed from a monohydrocarbylsilane triol of the formula $RSi(OH)_3$ wherein R is a substituted or unsubstituted monovalent hydrocarbon group, the degree of polymerization of said oligomer being from 2 to about 50, said solution having a viscosity of from about 2 to 200 centipoise at 25° C.

4,694,041

POLYMERIZABLE COMPOSITIONS AND THE USE OF ARYLAMINES AS HARDENING ACCELERATORS FOR THESE COMPOSITIONS

Helmut-Martin Meier, Hattingen; Rolf Dhein, Krefeld; Jens Winkel, Cologne; Gerhard Klein, Monheim, and Werner Klöker, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

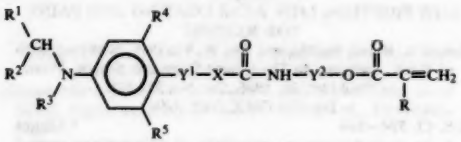
Continuation of Ser. No. 676,484, Nov. 29, 1984, abandoned. This application Aug. 14, 1986, Ser. No. 896,661

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 3345102

Int. Cl.[4] C08L *67/00*

U.S. Cl. 525—25 **10 Claims**

1. Unsaturated polyester resin composition containing an N,N-dialkylarylamine as the polymerization accelerator, wherein the accelerator is a compound of the formula



wherein

R is hydrogen or methyl,

Y^1 is a branched or straight chain alkyl with 1 to 6 carbon atoms,

Y^2 is a branched or straight chain alkylene with 2 to 8 carbon atoms,

X is oxygen or —NH—,

R^1 and R^2 are identical or different and each is hydrogen, alkyl, alkenyl, cycloalkyl, cycloalkyl, cycloalkenyl, aryl, aralkyl or alkaryl group which has 1 to 11 carbon atoms and which is unsubstituted or substituted by one or more hydroxyl amino, epoxy, urethane, urea, ester or ether groups,

or R^1 and R^2 together form a 3-membered to 6-membered ring, which is carbocyclic or contains a nitrogen, oxygen or sulphur hetero-atoms,

R^3 has the meaning of R^1 or is

or R^2 and R^3, together with the adjacent

form a 5-membered or 6-membered ring, which contains only the nitrogen atom as a heterocyclic ring member or which additionally is oxygen as a further heteroatom, and

R^4 and R^5 are identical or different and each is hydrogen, halogen, alkyl or alkenyl having 1 to 10 carbon atoms which is unsubstituted or substituted by halogen.

4,694,042

ELASTOMERIC THERMOPLASTIC MOLDING MATERIALS AND THEIR PREPARATION

Graham E. McKee, Weinheim; Hilmar Ohlig, Kaiserslautern; Horst Reimann, Worms, and Hans-Josef Sterzel, Dannstadt-Schauernheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 31, 1985, Ser. No. 696,790

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1984, 3403576

Int. Cl.[4] C08L *75/00, 77/00*

U.S. Cl. 525—66 **6 Claims**

1. An elastomeric thermoplastic molding material containing

(A) from 5 to 50 parts by volume of a partially or completely crystalline thermoplastic polymer comprising a nylon, a polyester or a polyacetal having a melting point of above 160° C., as a coherent phase, and

(B) from 95 to 50 parts by volume of one or more crosslinked elastomeric polymers which are prepared by emulsion polymerization, are dispersed in the component A and have a glass transistion temperature Tg of below −10° C., the sum of A and B being 100 parts by volume, wherein the elastomeric polymer B consists of esters of (meth) acrylic acid of not more than 15 carbon atoms and from 5 to 20% by weight of comonomers which possess 2 or more double bonds per molecule and can be crosslinked with free radicals, with the proviso that the mixture of A and B has a Vicat softening temperatures, measured according to DIN 53,460, which is 5°–40° C lower than that of the component A, with or without

(C) effective amounts of conventional assistants.

4,694,043

ADHESIVES WITH A HIGH LEVEL OF ADHESION ON PLASTICS MATERIALS

Wolfgang Fischer, Meerbusch; Gerhard Klein, Monheim; Rudolph Hombach, Leverkusen, and Wilfried Kniege, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 737,232, May 23, 1985, Pat. No. 4,605,703. This application Mar. 3, 1986, Ser. No. 835,333

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1984, 3420924

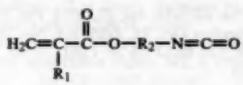
Int. Cl.[4] C08L *75/00*

U.S. Cl. 525—127 **2 Claims**

1. Two-component adhesives comprising as a first component parts (a) to (e) as follows:

(a) from 5 to 70 parts by weight of polymer,

(b) from 20 to 80 parts by weight of reactive diluent with a polymerizable group,
(c) from 1 to 20 parts by weight of reactive diluent with several polymerizable groups,
(d) from 5 to 50 parts by weight of polymerizable isocyanate of the formula



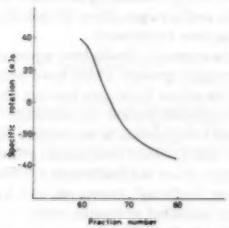
wherein
R_1 represents hydrogen or alkyl having from 1 to 5 carbon atoms and
R_2 represents straight chain or branched alkylene having from 1 to 10 carbon atoms, and
(e) from 1 to 10% by weight of peroxidic compound, based on the sum of the parts of (a) to (d)
and as a second component, an activator comprising a tertiary aromatic amine.

4,694,044

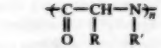
ADSORBENT

Hideaki Kiniwa, Yokohama, Japan, assignor to Research Development Corp. of Japan, Tokyo, Japan

Filed Mar. 6, 1985, Ser. No. 708,935
Claims priority, application Japan, Mar. 9, 1984, 59-440651; Jul. 13, 1984, 59-144372
Int. Cl.[4] C08F *8/30*
U.S. Cl. 525—178 **17 Claims**

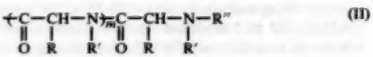


1. A cross-linked, polymeric material which has been reacted with a chemical cross-linking agent comprising a polymer carrier supporting thereon an optically active, synthetic poly(amino acid) represented by the general formula (I):



(I)

wherein R stands for an organic group, R′ stands for hydrogen or an alkyl group and n is an integer of at least 5, and a terminal amino group protected as shown by the general formula (II):



(II)

wherein R, R′ each has the same meaning as above, R″ stands for an organic group and m is an integer of at least 4.

4,694,045

BASE RESISTANT FLUOROELASTOMERS

Albert L. Moore, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 807,611, Dec. 11, 1985, abandoned. This application Jun. 17, 1986, Ser. No. 873,165
Int. Cl.[4] C08F *214/26, 214/18, 210/02, 259/08*
U.S. Cl. 525—276 **13 Claims**

1. A base resistant, substantially amorphous fluoroelastomer consisting essentially of (1) 10–40 mole percent ethylene units, (2) 32–60 mole percent tetrafluoroethylene units, (3) 20–40 mole percent perfluoro(alkyl vinyl ether) units wherein the alkyl group contains 1–5 carbon atoms, and (4) 0.2–3 mole percent of a cure-site monomer, said fluoroelastomer having a glass transition temperature below about −10° C.

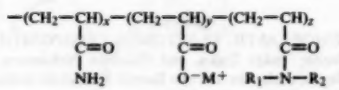
4,694,046

HYDROPHOBICALLY ASSOCIATING TERPOLYMERS OF ACRYLAMIDE, SALTS OF ACRYLIC ACID AND ALKYL ACRYLAMIDE

Jan Bock, Bridgewater; Donald B. Siano, Fanwood, both of N.J., and S. Richard Turner, Pittsford, N.Y., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Nov. 25, 1985, Ser. No. 801,226
Int. Cl.[4] C08F *8/42*
U.S. Cl. 525—329.4 **4 Claims**

1. A terpolymer having the formula:



wherein R_1 is a straight or branched chained alkyl or cycloalkyl having about 6 to about 22 carbon atoms; R_2 is the same as R_1 or different alkyl group or hydrogen; x is about 60 to about 98 mole percent; y is about 2 to about 40 mole percent; and z is about 0.1 to about 10.0 mole percent and M^+ is an alkali metal or ammonium cation.

4,694,047

HALOGENATED POLY(ALLOOCIMENE)

Richard L. Veazey, East Windsor, N.J., and Kathryn S. Hayes, Norristown, Pa., assignors to Union Camp Corporation, Wayne, N.J.

Filed Nov. 6, 1986, Ser. No. 927,921
Int. Cl.[4] C08F *8/22*
U.S. Cl. 525—332.3 **14 Claims**

1. Halogenated 2,3- and 6,7-poly(alloocimene).

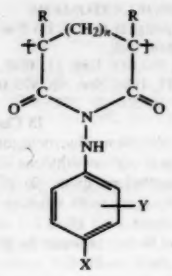
4,694,048

THERMOPLASTIC POLYMERS CONTAINING REPEATING HYDRAZIDE GROUPS

Eui W. Choe, Randolph, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Apr. 21, 1986, Ser. No. 854,274
Int. Cl.[4] C08F *8/30, 8/34*
U.S. Cl. 525—376 **15 Claims**

1. A thermoplastic polymer which consists of recurring structural units corresponding to the formula:



where R is a substituent selected from hydrogen or alkyl groups, n is the integer zero or one, X is a substituent selected from nitro, cyano, trifluoromethyl or tricyanoethylene groups, and Y is a substituent selected from hydrogen, alkyl, nitro or cyano groups.

4,694,049

THERMOPLASTIC ELASTOMER COMPOSITION

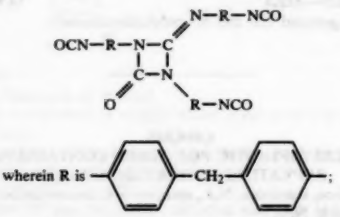
Ichiro Morita; Tadao Taika, and Hidehiro Nakamura, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha T/A Toyobo Co., Ltd., Osaka, Japan

Filed Nov. 5, 1985, Ser. No. 795,289
Claims priority, application Japan, Nov. 6, 1984, 59-233694
Int. Cl.[4] C08L *67/02, 67/04*
U.S. Cl. 525—440 **7 Claims**

1. A thermoplastic elastomer composition, which comprises:

100 parts by weight of a thermoplastic polyester block copolymer comprising a polyester segment having a high melting point and a polymer segment having a low melting point and having a molecular weight of 400 to 6,000 wherein a polymer produced from the polyester segment having a high melting point alone has a melting point of not lower than 150° C. and the polymer segment having a low melting point alone has a melting or softening point of not higher than 80° C., and

0.05 to 20 parts by weight of a liquid diphenylmethane diisocyanate comprising a mixture of pure diphenylmethane diisocyanate and a cycloadduct of the formula:



in said mixture of the pure diphenylmethane diisocyanate and the cycloadduct, these being in the molar ratio of the cycloadduct/pure diphenylmethane diisocyanate of 0.02 to 0.5/1.

4,694,050

PROCESS FOR ABSORBING POLAR MATERIALS USING TRANSAMIDATED POLY-2-OXAZOLINE COMPOSITIONS

William J. Fairchok, Saginaw; Ralph E. Friedrich; Bruce P. Thill, both of Midland, and Mark J. McKinley, Linwood, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 635,038, Jul. 27, 1984, Pat. No. 4,582,877.
This application Oct. 15, 1985, Ser. No. 787,593
Int. Cl.[4] B01J *20/26;* **C08L** *79/00*
U.S. Cl. 525—411 **4 Claims**

1. A process for absorbing polar materials by contacting said polar materials with a polymeric composition comprising:

(a) a poly-2-oxazoline; and

(b) a polybasic carboxylic acid; wherein said

(c) has crosslinked said poly-2-oxazline by transamidation.

4,694,051

CHIP RESISTANT COATING COMPOSITION III

Panagiotis I. Kordomenos, Mt. Clemens, and Andrew H. Dervan, Grosse Pointe Farms, both of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 19, 1986, Ser. No. 943,764
Int. Cl.[4] C08G *18/06, 16/36, 71/04*
U.S. Cl. 525—437 **21 Claims**

1. An organic solvent based, thermosetting coating composition comprising:

A. hydroxy functional urethane modified polyester resin having a number average molecular weight (M_n) between about 2,000 and about 20,000, said resin being the product of polymerization of lactone monomers in the presence of hydroxy-containing urethane modified polyester precursor (i) having a number average molecular weight (M_n) between about 1,000 and about 10,000, (ii) having a hydroxyl number between about 30 and about 300, and (iii) containing between about 1 and about 10 urethane groups per molecule, wherein the polymerization reaction mixture comprises between about 10 and about 80 weight percent said hydroxy-containing urethane modified polyester precursor and between about 90 and about 20 weight percent said lactone monomers;

B. blocked polyisocyanate crosslinking agent comprising at least two isocyanate groups which have been blocked by reaction with an active hydrogen bearing blocking agent, said blocked polyisocyanate crosslinking agent being included in said composition in an amount sufficient upon unblocking of the blocked isocyanate groups thereof to provide between about 0.5 and about 1.6 reactive isocyanate groups per hydroxyl group on said hydroxy functional urethane modified polyester resin;

C. diol modified blocked diisocyanate being the reaction product of:

(i) diol having a number average molecular weight between about 200 and about 2,000;

(ii) diisocyanate; and

(iii) active hydrogen bearing blocking agent for said diisocyanate;

wherein said diol (i), said diisocyanate (ii) and said active hydrogen bearing blocking agent (iii) are employed in a molar ratio of about 1:2:2, respectively and wherein said diol modified blocked diisocyanate unblocks at a temperature at least 10° C. lower than the temperature at which said blocked polyisocyanate crosslinking agent unblocks; and

D. polyamine having at least two amine groups selected from primary and secondary amine groups, said polyamine being essentially non-volatile at the temperature at which said diol modified blocked diisocyanate unblocks, wherein said diol modified blocked diisocyanate and said polyamine are included in said composition in (i) a molar ratio of from about 0.9:1.1 to about 1.1:0.9, respectively and (ii) a combined amount of between 10 and about 70

weight percent based on the total weight of components (A), (B), (C) and (D) of said composition.

4,694,052

RADIATION-CURABLE COATING COMPOSITION

Sumio Hirose, Yokohama; Isao Naruse, Isehara, and Akio Matsuyama, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Jun. 25, 1985, Ser. No. 748,480

Claims priority, application Japan, Jul. 2, 1984, 59-135336

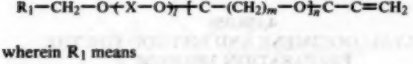
Int. Cl.[4] C08F *283/04*

U.S. Cl. 525—454 **3 Claims**

1. Radiation-curable coating composition, which comprises:

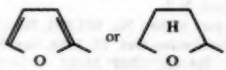
(A) a urethane-modified (meth)acrylate compound which has been prepared by reacting (a) a polyisocyanate compound containing two or more isocyanate groups per molecule, (b) a polyhydroxy compound containing two or more hydroxyl groups per molecule and (c) an unsaturated monohydroxy compound in amounts of 1.1 to 2.0 equivalents of the compound (a) and 0.1 to 1.2 equivalents of the compound (c), both per equivalent of the compound (b); and

(B) a mono(meth)acrylate of the following general formula (I):

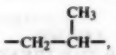


(I)

wherein R_1 means



R_2 denotes a hydrogen atom or methyl group, X is $—CH_2—CH_2—$ or



l stands for an integer of 1 to 6, m means an integer of 3 to 5, n is an integer of 1 to 6, and l=n is 2 to 8, the amounts of the compounds (A) and (B) being 20 to 60 weight percent and 80 to 40 weight percent, respectively.

4,694,053

METHOD FOR THE POLYMERIZATION OF VINYL CHLORIDE MONOMER IN AN AQUEOUS MEDIUM

Kenichi Itoh, Clute, Tex.; Genji Noguki, Yamaguchi, Japan; Motoaki Tanaka, and Hitoshi Ohba, both of Saitama, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1985, Ser. No. 748,433

The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.

Int. Cl.[4] C08L *37/00*

U.S. Cl. 526—74 **4 Claims**

1. In a method for the suspension polymerization of vinyl chloride monomer or a monomer mixture mainly composed of vinyl chloride in an aqueous medium in the presence of a monomer-soluble polymerization initiator, an improvement which comprises admixing the aqueous medium with:

(a) a water-soluble crosslinked copolymer of 100 parts by weight of acrylic acid and from 0.05 to 10 parts by weight of bisallyl ether or bismethallyl ether of diethyleneglycol; and

(b) a non-ionic surface active agent.

4,694,054

COBALT(II) CHELATES AS CHAIN TRANSFER AGENTS IN FREE RADICAL POLYMERIZATIONS

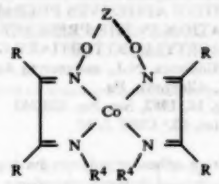
Andrew H. Janowicz, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 707,367, Mar. 1, 1985, abandoned. This application Jan. 27, 1986, Ser. No. 821,321

Int. Cl.[4] C08F *2/40*

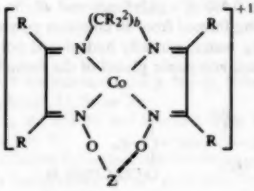
U.S. Cl. 526—93 **59 Claims**

1. In an improved free radical polymerization of monomer wherein molecular weight control is effected by means of a chain transfer agent, the improvement characterized in that the chain transfer agent is a cobalt chelate of the formula



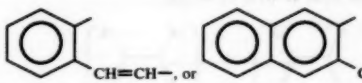
(III)

or



(IV)

wherein each R, independently, is phenyl or C_1 to C_{12} alkyl wherein each α-carbon atom contains two hydrogen atoms, or R and R on adjacent carbon atoms, taken together, is C_5 to C_8 cycloalkylene, unsubstituted in the α-positions, —CH=CH—CH=CH—,



R^2 is H or C_xH_{2x+1} wherein x is 1 to 12; each R^4, independently, is H or C_xH_{2x+1} wherein X is 1 to 12, or both R^4 groups taken together is —O—Z—O—; n is 2 or 3; Z is BF_2, BCl_2, BBr_2 or BR_2^2; and X^- is NO_3^-, Cl^-, Br^-, I^-, BF_4^-, PF_6^-, SbF_6^- or R^1COO^- wherein R^1 is C_1 to C_{12} alkyl.

4,694,055

METHOD FOR THE SUSPENSION POLYMERIZATION OF VINYL CHLORIDE MONOMER

Kenichi Itoh, Clute, Tex.; Genji Noguki, Yamaguchi, and Masanobu Nakahara, Ibaraki, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1985, Ser. No. 748,432

The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.

Int. Cl.[4] C08L *33/02*

U.S. Cl. 526—201 **4 Claims**

1. In a method for the suspension polymerization of vinyl chloride monomer or a monomer mixture mainly composed of vinyl chloride in an aqueous polymerization medium containing a non-ionic surface active agent and in the presence of a monomer-soluble polymerizatin initiator, an improvement which comprises admixing the aqueous polymerization me-

dium with a water-soluble cross-linked copolymer having carboxyl groups at a moment when the percentage of the monomer conversion is in the range from 1 to 20%, wherein the water-soluble cross-linked copolymer having carboxyl groups is a copolymer of 100 parts by weight of acrylic acid and from 0.05 to 10 parts by weight of diethyleneglycol bisallyl or bismethallyl ether.

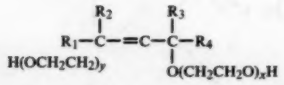
4,694,056

PRESSURE SENSITIVE ADHESIVES PREPARED BY POLYMERIZATION IN THE PRESENCE OF ETHOXYLATED ACETYLENIC TERTIARY GLYCOL

William E. Lenney, Middlesex, N.J., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 16, 1982, Ser. No. 408,363
Int. Cl.⁴ C08F *2/30*
U.S. Cl. 526—202 **5 Claims**

1. A pressure sensitive adhesive polymer having excellent tack, peel and shear adhesion strength comprising by weight 34.4–40% vinyl acetate, 56.6–65% of a C_{8-12} diester of an alpha, beta-unsaturated dicarboxylic acid, 0.5 to 3.0% of unsaturated acid and 0.1 to 0.4% of a polyfunctional allylic monomer, said polymer being formed from an emulsion polymerization recipe comprising water, partially hydrolyzed polyvinyl alcohol and ethoxylated acetylenic glycol of the formula:



in which R_1 and R_4 are alkyl radicals containing from 3–10 carbon atoms, R_2 and R_3 are selected from the group consisting of methyl and ethyl, and x and y have a sum in the range of 3–60, inclusive and a catalyst, at a temperature sufficient to effect polymerization of the monomers, said polymer having a percent insolubles in toluene at reflux temperature and atmospheric pressure from 45–65% by weight.

4,694,057

PREPARATION OF POLYMERS CONTAINING PENDANT ISOCYANATE GROUPS AND DERIVATIVES THEREOF BY EMULSION COPOLYMERIZATION

Robert A. Smith, Uniontown; Dane K. Parker, Massillon; Howard A. Colvin, Akron; Arthur H. Weinstein, Hudson; Dennis B. Patterson, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 6, 1985, Ser. No. 708,840
Int. Cl.⁴ C08F *2/22*
U.S. Cl. 526—206 **23 Claims**

1. A process for the emulsion copolymerization of TMI with diene monomers into TMI containing copolymers wherein said emulsion copolymerization is carried out in an aqueous medium comprising (a) at least about 1 weight percent TMI, based upon the total amount of monomers in the aqueous medium, (b) at least about 50 weight percent of at least one diene monomer, based upon the total amount of monomers in the aqueous medium, (c) an emulsifier, (d) a redox initiator system, (e) a brominated hydrocarbon chain transfer agent, and (f) water; and wherein said TMI containing copolymers have pendant isocyanate groups and a gel content of less than 5 percent by weight.

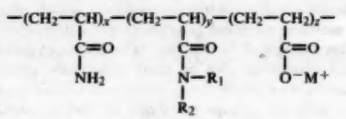
4,694,058

HIGH MOLECULAR WEIGHT TERPOLYMERS OF ACRYLAMIDE, ACRYLIC ACID SALTS AND ALKYLACRYLAMIDE

Donald B. Siano, Fanwood, and Jan Bock, Bridgewater, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 801,331, Nov. 25, 1985. This application May 27, 1986, Ser. No. 866,724
Int. Cl.⁴ C08F *220/70*
U.S. Cl. 526—307.2 **2 Claims**

1. A terpolymer characterized by the formula:



wherein R_1 is a C_6 to C_{22} straight chain or branched alkyl or cycloalkyl group; R_2 is the same or different alkyl group as R_1, or hydrogen; M^+ is an alkali metal, wherein x is about 0.50 to about 0.999; y is about 0.002 to about 0.05; and z is about 0.1 to about 0.3 and the intrinsic viscosity of the terpolymer dissolved in 2% NaCl is greater than about 12 dl/g.

4,694,059

POLYALLOOCIMENE AND METHOD FOR THE PREPARATION THEREOF

Richard L. Veazey, East Windsor, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Continuation-in-part of Ser. No. 801,899, Nov. 26, 1985, abandoned. This application Oct. 16, 1986, Ser. No. 919,844
Int. Cl.⁴ C08F *36/22*
U.S. Cl. 526—340.3 **22 Claims**

1. A polyalloocimene comprised of a mixture of polymer chain units of 2,3 alloocimene and 6,7 alloocimene.

4,694,060

PROCESS FOR THE TREATMENT OF POLYORGANOSILAZANES AND/OR OF POLYORGANO(DISILYL)SILAZANES BY MEANS OF A TREATMENT OF POLYORGANOSILAZANES WITH A CATALYST SYSTEM COMPRISING AN IONIC INORGANIC SALT AND A COMPLEXING COMPOUND

Huques Porte, Lyons, and Jean-Jacques Lebrun, Caluire, both of France, assignors to Rhone-Poulenc Specialites Chimiques, France

Filed May 6, 1986, Ser. No. 860,038
Claims priority, application France, May 6, 1985, 85 06828
Int. Cl.⁴ C08G *77/06*
U.S. Cl. 528—14 **25 Claims**

1. A process for the treatment of a polysilazane comprising the step of

catalytically treating at least one polysilazane selected from the group consisting of an organopolysilazane, an organopoly(disilyl)silazane, and a mixture thereof, with a catalytically effective amount of a catalyst system, the polysilazane being free from any hydrogen atoms bonded directly to the silicon atoms and wherein the organic radicals bonded to the silicon atoms in the polysilazane are hydrocarbon radicals,

the catalyst system comprising (i) an ionic inorganic salt of a formula $M^+ A^-$ wherein M^+ is selected from the group consisting of a metal ion and a quaternary ammonium compound, and A^- is an anion compatible with M^+, and (ii) a compound capable of complexing with the M^+ cation.

4,694,061
RADIATION-SENSITIVE POLYCONDENSATES, PROCESSES FOR THEIR PREPARATION COATED MATERIAL AND ITS USE

Josef Pfeifer, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 4, 1984, Ser. No. 657,870

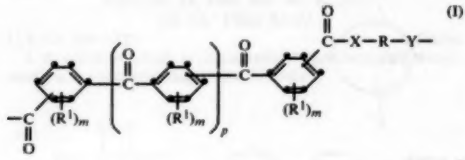
Claims priority, application Switzerland, Oct. 12, 1983, 5570/83

Int. Cl.[4] G03C *1/01*

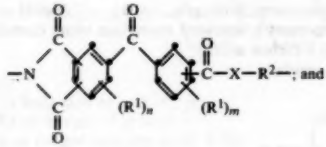
U.S. Cl. 528—125 **22 Claims**

1. A radiation-sensitive linear saturated homopolymer or copolymer, selected from the group consisting of the polyamides and polyamide-imides, which comprises

(a) 100 to 10 mol %, based on the total polymer, of at least one of the recurring structural units of formula I, formula II or mixtures thereof

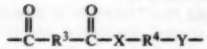


(I)

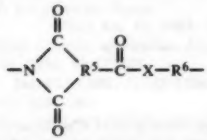


(II)

(b) 0 to 90 mol %, based on the total polymer of recurring structural units of formula III, formula IV or mixtures thereof



(III)



(IV)

in which the imide group in structural element II is bonded to two adjacent C atoms, m is 0 or a number from 1 to 4, p is 0 or a number from 1 to 5 and n is 0 or a number from 1 to 3, X is —NR^7— and Y independently has the same meaning as X, R^1 is alkyl or alkoxy having less than 6 C atoms, aryl having 6 to 10 C atoms, aralkyl having 7 to 10 C atoms or halogen, R is an unsubstituted divalent aliphatic, cycloaliphatic, araliphatic or aromatic radical; or said aliphatic radical substituted by halogen, by alkyl of 1 to 6 C atoms or by alkoxy of 1 to 6 C atoms; or said cycloaliphatic radical substituted by alkyl of 1 to 4 C atoms, or said araliphatic radical substituted on the aryl by alkyl of 1 to 6 C atoms; or said aromatic radical substituted by alkoxyalkyl, alkoxy, by alkyl of 1 to 6 C atoms, by trimethylene or tetramethylene; or R and one of the radicals R^7 together are alkylene having 5 to 7 C atoms, to which the second —NR^7— group is bonded, or R is methylene, ethylene or propylene and the two radicals R^7 of the NR^7 groups together are ethylene or propylene, R^2 is an unsubstituted divalent aliphatic or aromatic hydrocarbon radical; or said aliphatic radical substituted by halogen, by alkyl of 1 to 6 C atoms or by alkoxy of 1 to 6 C atoms; or said aromatic radical substituted by alkoxyalkyl, by alkoxy, by alkyl of 1 to 6 carbon atoms, by trimethylene or by tetramethylene; or R^2 and R^7 together are alkylene having 5 to 7 C atoms, R^4 independently has the same meaning as R, and R^6 independently has the same meaning as R^2, R^3 is a divalent saturated aliphatic or aromatic radical, R^5 is a trivalent saturated aliphatic or aromatic radical in which the imide group is bonded to two adjacent C atoms and R^7 is a hydrogen atom, alkyl, cycloalkyl, aryl, aralkyl or alkaralkyl.

4,694,062
METHOD OF MAKING ELECTROACTIVE HETEROCYCLIC AROMATIC POLYMERS

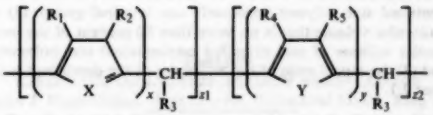
Samson A. Jenekhe, Bloomington, and Marcia K. Hansen, St. Louis Park, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 8, 1986, Ser. No. 905,084

Int. Cl.[4] C08G *12/26*

U.S. Cl. 528—232 **12 Claims**

1. A method of making electroactive polymers of the structure



wherein:

X and Y are selected from S, N—H, N-lower alkyl (C=1-7), N-phenyl, O, Se or Te;

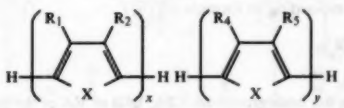
R_1, R_2, R_4 and R_5 are selected from H and lower alkyls (C=1 to 7);

R_3 is selected from the class consisting of aliphatic, aromatic and heterocyclic groups derivable from aldehydes of the formula R_3CHO;

x and y are positive integers having a value between 1 and 5;

at least one or both of Z_1 and Z_2 are positive integers having a value between 1 and 10,000;

which comprises reacting an amount of aldehyde of the formula R_3CHO, wherein R_3 is defined as above, with amounts of monomers of the structure



wherein R_1–R_4, X, Y and x and y are defined as above the presence of a compatible inert organic solvent and in the presence of a protic acid catalyst, employing a molar ratio of monomers to aldehyde within the range of from about 0.1 to 1 to 2.0 to 1 and separating the copolymer from the reaction mixture.

4,694,063
ANHYDROUS PROCESS FOR THE MANUFACTURE OF POLYAMIDE POWDER FROM LACTAM IN THE PRESENCE OF N,N'-ALKYLENE BIS AMIDE

Jean-Claude Hilaire, and Roland Guerin, both of Pau, France, assignors to Atochem, France

Filed Jan. 21, 1986, Ser. No. 820,661

Claims priority, application France, Jan. 30, 1985, 85 01274

Int. Cl.[4] C08G *69/16*

U.S. Cl. 528—315 **11 Claims**

1. A process for the manufacture of a polyamide powder comprising polymerizing in solution a reaction mixture from which any trace of water has been eliminated and comprising a monomer lactam or lactams capable of generating said polyamide in the presence of an N,N'-alkylene bisamide, an activa-

tor, a solvent, a catalyst, and a finely-divided inert material to generate crystallization nuclei.

4,694,064

ROD-SHAPED DENDRIMER

Donald A. Tomalia, and Pamela M. Kirchhoff, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 28, 1986, Ser. No. 834,993
Int. Cl.[4] C08G 69/10
U.S. Cl. 528—332 **13 Claims**

1. A cylindrically-shaped dendrimer having at least 8 core branches emanating from an essentially linear core, each core branch extending through at least two generations and having at least two terminal groups provided that (1) the ratio of terminal groups to the branches emanating from the core is more than one, (2) the density of terminal groups in the dendrimer is at least 1.5 times that of an extended conventional star polymer having a similar linear core and monomeric moieties and a comparable molecular weight and number of core branches wherein each of such branches of the extended conventional star polymer bears only one terminal group, (3) a molecular volume that is no more than 80 percent of the molecular volume of said extended conventional star polymer, and (4) the aspect ratio of the molecules of the dendrimer is at least 2:1.

4,694,065

PROCESS FOR THE PRODUCTION OF DUROMERIC ALIPHATIC POLYCARBONATES

Peter Mues; Hans-Josef Buysch; Bert Brassat, all of Krefeld, and Heinrich Heine, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 2, 1986, Ser. No. 815,648
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1985, 3501246
Int. Cl.[4] C08G 63/62
U.S. Cl. 528—371 **4 Claims**

1. A process for the production of duromeric aliphatic polycarbonates by ring-opening copolymerization of monocyclic ring carbonates and difunctional ring carbonates having a cross linking action, characterised in that catalyst systems is a catalyst corresponding to formula (I)

$$X(R^1)_y \quad \text{(I)},$$

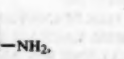
in which

X is an ion from groups IA-IIIA, IIIB or VA of the periodic system,

R^1 is a C_1–C_8-alkylalcoholate, C_7–C_{15}-aralkylalcoholate, C_4–C_{18}-thiolate, cyanide, cyanate, thiocyanate, aliphatic (C_1–C_8)carboxylate, aromatic carboxylate, carbonate, C_1–C_8-alkyl carbonate, oxide, halide or C_1–C_4-alkyl radical,

Y represents 1, 2, 3 or 4

or a catalyst corresponding to formula (II)

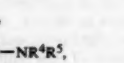


(II)

wherein

R^2 represents C_1–C_4 alkyl, $—NH_2$, —NH-alkyl(C_1–C_4), $—N(alkyl(C_1–C_4))_2$ or $—NHNH_2$

and a cocatalyst, selected from the group corresponding to one of formulae IIIa, aliphatic acid amides,



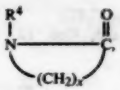
(IIIa)

in which

R^3 represents C_1–C_5-alkyl,

R^4 and R^5 represent hydrogen or C_1–C_4-alkyl,

IIIb, cyclic amides



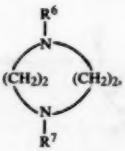
(IIIb)

in which

R^4 has the meaning given for formula IIIa and

X represents an integer of from 3 to 6,

IIIc, cyclic amines

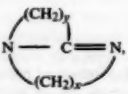


(IIIc)

in which

R^6 and R^7 represent hydrogen, $—CH_3$, $—C_2H_4OH$ or together represent a saturated methylene chain containing from 2 to 4 carbon atoms,

IIId, bicyclic amidines

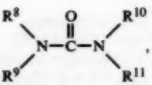


(IIId)

in which

X,Y represent an integer of from 2 to 5,

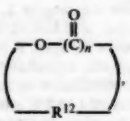
or IIIe, acyclic and cyclic ureas



(IIIe)

in which

R^8 to R^{11} represent hydrogen, C_1–C_4-alkyl, C_6–C_{10}-aryl and wherein also the nitrogen atoms be linked together to form a ring via two radicals R^8, R^{10} or R^9, R^{11} via a C_2 to C_4 chain, or general formula (IV)



(IV)

wherein

R^{12} represents $—(CH_2)_s—$ in which s=2–5 when n=1 and $—(CH_2CH_2O—_t CH_2CH_2—$ in which t=1–6 when n=0 and

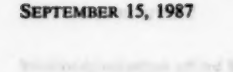
n is 0 or 1,

or formula (V)

$$R^{13}—ZH \quad \text{(V)},$$

wherein

R^{13} represents $—CH_2CH_2OH$, $—(CH_2CH_2)_r—OH$,



C_5–C_{12}-alkyl or a phenyl ring
v represents 1–200,
Z represents O and S,
are used.

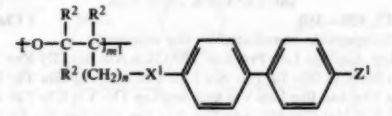
4,694,066

POLYOXYALKYLENE POLYMERS EXHIBITING NONLINEAR OPTICAL RESPONSE

Ronald N. DeMartino, Wayne; Hyun-Nam Yoon, New Providence; James B. Stamatoff, Westfield, and Alan Buckley, Berkeley Heights, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Jan. 24, 1986, Ser. No. 822,092
Int. Cl.[4] C08G *65/22*
U.S. Cl. 528—373 **6 Claims**

1. A polymer which is characterized by a recurring monomeric unit corresponding to the formula:



where
R^2 is hydrogen or a C_1–C_4 group;
m^1 is an integer of at least 5;
n is an integer between about 4–20;
X^1 is $—NR^1—$, —O— or —S—;
R^1 is hydrogen or methyl; and
Z^1 is $—NO_2$.

4,694,067

RUBBER COMPOSITION FOR DUST COVER BOOTS

Akio Maeda, Yokohama; Takeshi Chida, Kamakura, and Hirokatsu Seya, Kawasaki, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Jul. 16, 1985, Ser. No. 755,586
Claims priority, application Japan, Jul. 17, 1984, 59-148090; Oct. 11, 1984, 59-213208
Int. Cl.[4] C08L *71/02*; C08G *65/12, 65/14, 65/24*
U.S. Cl. 528—393 **12 Claims**

1. An improved rubber composition having characteristics of improved heat resistance, cold resistance, dynamic ozone resistance and bending resistance rendering it suitable for use as dust cover boots comprising a copolymer rubber composed of 10 to 60 mole % of epichlorohydrin, 30 to 90 mole % of propylene oxide or both propylene oxide and ethylene oxide with the propylene oxide/ethylene oxide mole ratio being at least 1 and 0 to 15 mole % of an unsaturated epoxide, and a vulcanization agent for the copolymer rubber.

4,694,068

METHOD FOR THE PREPARATION OF A VINYLIDENE CHLORIDE INTERPOLYMER FILM

Phillip DeLassus, and William J. Raich, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 1, 1984, Ser. No. 655,794
Int. Cl.[4] C08F *6/00*
U.S. Cl. 528—502 **6 Claims**

1. An improved process for preparing a vinylidene chloride interpolymer article having enhanced barrier to atmospheric gases and water vapor, the process comprising four sequential steps, the steps being:

(a) preparing a vinylidene chloride interpolumer, the vinylidene chloride interpolymer having polymerized therein vinylidene chloride in an amount of from about 75 to about 95 percent by weight of interpolymer and from about 25 to about 5 percent by weight of interpolymer of at least one monomer copolymerized therewith, said interpolymer having a monomer copolymerized therewith, said interpolymer having a melting point;

(b) recovering the vinylidene chloride interpolymer;

(c) heat plastifying said vinylidene chloride interpolymer; and

(d) fabricating said heat plastified interpolymer into an article; wherein the improvement comprises fabricating the vinylidene chloride interpolymer into an article in a manner which allows between about 5 and about 50 percent crystallization to occur in the vinylidene chloride interpolymer article while the article is at a temperature above about 90° C. and below the melting point of the interpolymer but before the interpolymer cools below about 90° C.

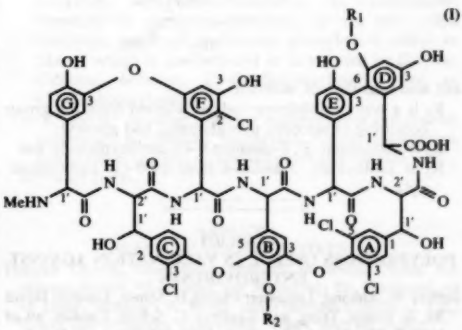
4,694,069

KIBDELOSPORANGIUM ARIDUM SK&F-AAD-609

John J. Dingerdissen, West Chester; Rajanikant Mehta, King of Prussia; Louis J. Nisbet, Rosemont; Marcia C. Shearer, Conshohocken, and Gail F. Wasserman, Devon, all of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

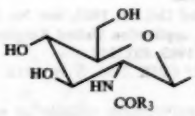
Filed Sep. 30, 1985, Ser. No. 781,422
Int. Cl.[4] A61K *35/74*; C12P *1/00, 1/04*
U.S. Cl. 530—317 **40 Claims**

1. A biologically pure culture of *Kibdelosporangium aridum largum* which has the identifying characteristics of ATCC 39922 and mutants and derivatives thereof, said microorganism and mutants and derivatives bein capable of producing AAD-609 antibiotics



(I)

wherein R_1 is mannosyl or hydrogen, and R_2 is a glycolipid radical having the structure



wherein R_3 is a C_{8-12} alkyl or alkenyl, branched or linear, optionally substituted by hydroxyl, or the desoxy analog thereof in recoverable quantity upon cultivation in an aqueous nutrient medium containing assimilable sources of carbon and nitrogen.

4,694,070

WATER SOLUBLE XANTHYLIUM DERIVATIVES SUBSTRATES

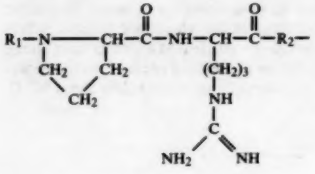
Gary A. Mitchell, Miami Lakes; Gerald E. Jaffe, Pembroke Pines, and Marilyn M. Solorzano, Sunrise, all of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

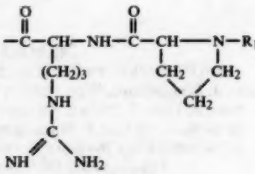
Filed May 28, 1985, Ser. No. 737,761

Int. Cl.[4] C07K *7/06;* **C12Q** *1/38*

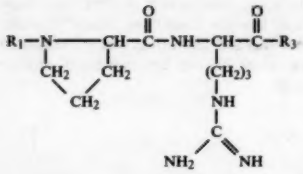
U.S. Cl. 530—329 **4 Claims**

1. A xanthylium derivative substrate selected from the group consisting of:





and



and acid salts thereof, wherein:

R_1 is a water solubilizing radical selected from the group consisting of sarcosyl, pyroglutamyl, and glutaryl;

R_2 is xanthylium, 3′, 6′-diamino-9′-(2-carboxyphenyl); and

R_3 is xanthylium, 3′-amino-6′-hydroxy-9′-(2- carboxyphenyl).

4,694,071

POLYPEPTIDES USEFUL IN VACCINATION AGAINST ENTEROVIRUSES

Jeffrey W. Almond, Leicester; Phillip D. Minor, London; David M. A. Evans, Tring, and Geoffrey C. Schild, London, all of United Kingdom, assignors to National Research Development Corporation, London, England

PCT No. PCT/GB83/00254, § 371 Date Jun. 8, 1984, § 102(e) Date Jun. 8, 1984, PCT Pub. No. WO84/01575, PCT Pub. Date Apr. 26, 1984

PCT Filed Oct. 11, 1983, Ser. No. 619,155

Claims priority, application United Kingdom, Oct. 11, 1982, 8228976; Jun. 24, 1983, 8317242

Int. Cl.[4] C07K *7/06, 7/08;* **A61K** *39/02*

U.S. Cl. 530—329 **29 Claims**

1. A synthetic polypeptide, suitable for use in vaccination against or diagnosis of a disease caused by an enterovirius, which is a hexapeptide coded for by codons 93 to 98 in the RNA sequence coding for the structural capsid protein VP1 of a poliovirus type 3 Sabin strain or by equivalent codons of another enterovirus or is an antigenic equivalent of such a hexapeptide, the antigenic equivalent being:

(i) a said hexapeptide modified by the inclusion therein of one or more changes to the amino acid sequence or

(ii) a longer peptide of up to eighteen amino acid residues incorporating a said hexapeptide or a said modified hexapeptide sequence, each said antigenic equivalent being capable of raising antibodies capable of neutralising the same strain and type of enterovirus as the said hexapeptide to which each said antigenic equivalent corresponds and the numbers of the codons being counted from the 5′-terminus of the nucleotide sequence coding for the VP1 capsid protein.

4,694,072

PEPTIDES COMPRISING AN IMMUNOGENIC SITE OF POLIOVIRUS AND DNAS CONTAINING NUCLEOTIDE SEQUENCES CODING FOR THESE PEPTIDES

Marc Girard, and Sylvie van der Werf, both of Paris, France, assignors to Institut Pasteur, Paris, France

PCT No. PCT/FR83/00241, § 371 Date Jul. 27, 1984, § 102(e) Date Jul. 27, 1984

PCT Filed Nov. 30, 1983, Ser. No. 634,881

Claims priority, application France, Nov. 30, 1982, 82 20115; Jun. 29, 1983, 83 10778

Int. Cl.[4] C07K *7/10, 7/08*

U.S. Cl. 530—350 **5 Claims**

1. Polypeptide constituted by the sequence:

Ser Arg Asp Ala Leu Pro Asn Thr GLu Ala Ser Gly Pro Thr His Ser Lys Glu Ile Pro Ala Leu Thr Ala Val Glu Thr Gly Ala Thr Asn Pro Leu Val Pro Ser Asp Thr Val Gln Thr Arg His Val Val Gin His Arg Ser Arg Ser Glu Ser Ser Ile Glu Ser Phe Phe Ala Arg Gly Ala Cys Val Thr Ile Met Thr Val Asp Asn Pro Ala Ser Thr Thr Asn Lys Asp Lys Leu Phe Ala Val Trp Lys Ile Thr Tyr Lys Asp Thr Val Gln Leu Arg Arg Lys Leu Glu Phe Phe Thr Tyr Ser.

4,694,073

METHOD OF SOMATOTROPIN SOLUBILIZATION AND NATURATION USING DIMETHYLSULFOXIDE

Larry A. Bentle, St. Charles; James W. Mitchell, St. Louis; Stephen B. Storrs, Creve Coeur, and Grant T. Shimamoto, Maryland Heights, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 704,341, Feb. 22, 1985, and a continuation-in-part of Ser. No. 704,677, Feb. 22, 1985, Pat. No. 4,652,630. This application Aug. 25, 1986, Ser. No. 900,017

Claims priority, application Spain, Feb. 20, 1986, 552233

Int. Cl.[4] C07K *15/00, 3/08*

U.S. Cl. 530—399 **19 Claims**

1. A method for naturation of somatotropin protein which comprises contacting a dimethylsulfone or urea-dimethylsulfone solution containing said protein with a mild oxidizing agent for a time sufficient to form intramolecular disulfide bonds between cysteine residues contained in said somatotropin protein.

4,694,074

PROCESS FOR THE PURIFICATION OF HBSAG

Yahiro Uemura; Takao Ohmura, both of Osaka; Akimasa Ohmizu, Hyogo; Akinori Sumi; Wataru Ohtani, both of Osaka; Yoshitaka Sakanishi, Hyogo; Hiroshi Morise; Hirofumi Arimura, both of Osaka, and Tadakazu Suyama, Kyoto, all of Japan, assignors to Green Cross Corporation, Osaka, Japan

Filed Oct. 28, 1985, Ser. No. 792,081

Claims priority, application Japan, Oct. 26, 1984, 59-224116

Int. Cl.[4] A61K *39/29;* **C12P** *21/00;* **C07K** *3/18, 3/28*

U.S. Cl. 530—417 **6 Claims**

1. A process for the purification of HBsAg obtained by DNA recombination, which comprises adding an inorganic salt to a crude HBsAg solution, said HBsAg having been obtained by DNA recombination, in a concentration so that the resultant HBsAg solution has an inorganic salt concentration of five to twenty-five W/V percent, bringing the resultant

solution into contact with a fixing carrier having hydrophobic groups selected from the group consisting of a phenylalanine residue, an alkyl group containing two to eight carbon atoms and a phenyl group, said carrier having been equilibrated with an inorganic salt solution of the same concentration as the resultant HBsAg solution, to adsorb thereon HBsAg with a solution of the inorganic salt to wash away contaminating free proteins and eluting the HBsAg with a buffer solution.

4,694,075

BISAZO COMPOUNDS CONTAINING ANTHRANILIC ACID AND THIAZOLE MOIETIES

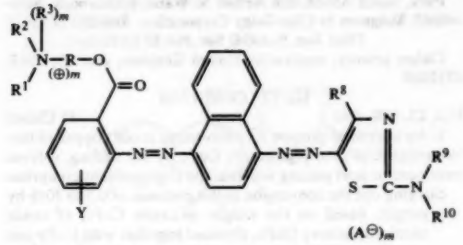
Horst Colberg, Schifferstadt, and Erwin Hahn, Heidelberg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

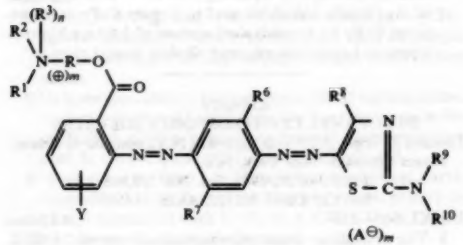
Filed Jan. 21, 1986, Ser. No. 820,018

Int. Cl.[4] C09B *31/14, 44/08;* D06P *1/04, 1/41*

U.S. Cl. 534—604 **13 Claims**

1. A compound of the formula:

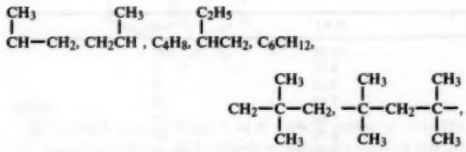




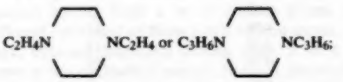
where

Y is hydrogen, chlorine, bromine or nitro;

R is C_2H_4, C_3H_6,



$C_2H_4OC_2H_4$, $C_3H_6OC_3H_6$, $C_3H_6OC_3H_6$, $C_3H_6OC_4H_8OC_3H_6$, $C_3H_6OC_2H_4OC_2H_4OC_3H_6$, $C_2H_4NHC_2H_4$, $C_2H_4NHC_3H_6$, $C_3H_6NHC_3H_6$, $C_3H_6NHC_2H_4NHC_3H_6$, $C_3H_6NHC_6H_{12}NHC_3H_6$,



m is 0 or 1;

R^1 and R^2 independently of one another are each hydrogen, allyl, methallyl, C_1–C_{14}-alkyl, C_1–C_{14}-alkenyl, C_5–C_8-cycloalkyl, C_1–C_{14}-aralkyl, or C_1–C_{14}-aryl, unsubstituted or substituted by N-cycloalkylamino, N,N-di-C_1–C_5-alkylamino, hydroxyl or C_1–C_8-alkoxy,

or R^1 and R^2 together with the nitrogen may form pyrrolidine, piperidine, morpholine, piperazine unsubstituted or substituted at the nitrogen by methyl, ethyl, n- or isopropyl, n-, iso- or sec-butyl, 2-hydroxyethyl, 2-aminoethyl, 2- or 3-hydroxypropyl or 2- or 3-aminopropyl, imidazole unsubstituted or substituted in 2- or 4-position by methyl, ethyl, propyl or butyl, or N-3-(C_1–C_{12})-alkyl or vinylimidazole unsubstituted or substituted in the 2- or 4-position by methyl, ethyl, propyl or butyl;

R^3 is hydrogen, C_1–C_{12}-alkyl, or C_2–C_4-hydroxyalkyl;

R^6 and R^7 independently of one another are each hydrogen, hydroxyl, C_1–C_4-alkoxy, methyl, $NHCOCH_3$, $NHCOC_2H_5$, $NHCOC_6H_5$, $NHCONH_2$, $NHCON(CH_3)_2$or $NHCONHC_6H_5$;

R^8 is hydrogen, acetyl, benzoyl, C_1–C_4-alkyl which is unsubstituted or substituted by chlorine, bromine, cyano, hydroxyl, C_1–C_4-alkoxy, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkylmercapto, phenoxy, sulfophenoxy, phenylmercapto, amino, N-mono- or N,N-di-C_1–C_4-alkylamino, phenylamino, sulfophenylamino, C_1–C_4-alkanoylamino sulfoethylamino, vinyl, cyclohexyl, thienyl, thiazolyl, phenyl which is unsubstituted or substituted by fluorine, chlorine, bromine, hydroxyl, C_1–C_4-alkoxy, β-C_1–C_4-alkanoyloxyethoxy, β-cyanoethoxy, β-carboxyethyoxy, β-C_1–C_4-alkoxycarbonylethoxy, phenoxy, sulfophenoxy, C_1–C_4-alkylmercapto, phenylmercapto, amino, β-C_1–C_4-alkanoylamino, benzoylamino, C_1–C_4-alkylamino or dialkylamino, phenylamino, sulfophenylamino, C_1–C_4-alkylsulfonylamino or phenylsulfonylamino;

R^9 and R^{10} independently of one another are each hydrogen, C_1–C_8-alkyl which is unsubstituted or substituted by hydroxyl, carboxyl, cyano, chlorine, bromine, phenyl, C_1–C_8-alkoxy, C_1–C_4-alkanoyloxy, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkanoylamino, acetyl, C_1–C_4-alkylaminocarbonyloxy, arylaminocarbonyloxy, C_1–C_4-alkoxycarbonyloxy or phenoxycarbonyloxy, or are each, allyl, methallyl, propargyl, cyclohexyl, phenyl-C_1–C_5-alkyl, or phenyl which is unsubstituted or substituted by fluorine, chlorine, bromine, C_1–C_4-alkoxycarbonyl, nitro or C_1–C_4-alkanoylamino;

or R^9 and R^{10} together with the nitrogen form pyrrolidino, piperidino, morpholino, piperazino, α-methylpiperazino, hexamethyleneimino or thiomorpholino S-dioxide; and

A^- is an anion.

4,694,076

SIALIC ACID DERIVATIVES

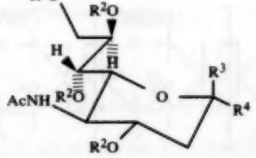
Tomoya Ogawa, Musashino; Mamoru Sugimoto, Niiza; Yoshiyasu Shitori, Musashino, and Masayoshi Ito, Kunitachi, all of Japan, assignors to Kanto Ishi Pharmaceutical Co., Ltd., Tokyo and Rikagaku Kenkyusho, Wako, both of, Japan

Filed Dec. 11, 1984, Ser. No. 680,498

Int. Cl.[4] C07H *5/06*

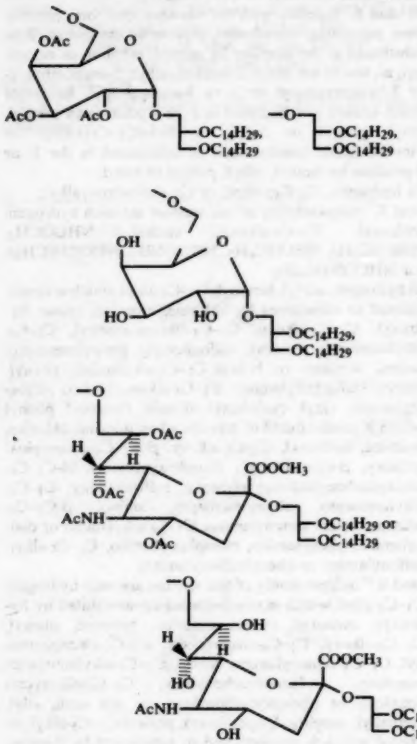
U.S. Cl. 536—17.2 **14 Claims**

1. A sialic acid derivative of the formula:



wherein R^1 is hydrogen, trityl, or acetyl, R^2 is hydrogen or

acetyl, one of R^3 and R^4 is carboxyl, methoxycarbonyl or ethoxycarbonyl, and the other of R^3 and R^4 is



4,694,077

NOVEL CELLULOSE DERIVATIVE, PROCESS FOR PREPARING THE SAME AND SULFUR DIOXIDE GAS PERMSELECTIVE MEMBRANE COMPRISING THE SAME

Kiyokazu Imai; Tomoo Shiomi, and Yasuyuki Tezuka, all of Nagaoka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

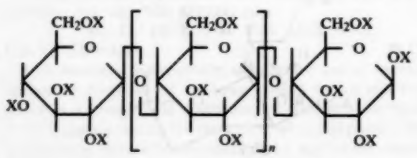
Filed Sep. 2, 1986, Ser. No. 902,625

Claims priority, application Japan, Aug. 30, 1985, 60-191088; Aug. 30, 1985, 60-191089; Apr. 25, 1986, 61-097682; Apr. 25, 1986, 61-097683

Int. Cl.[4] C08B *11/04*

U.S. Cl. 536—92 **10 Claims**

1. A hydrocarbylsulfinylethyl cellulose represented by the formula (I):



(I)

wherein X may be the same or different and represents hydrogen atom or hydroxycarbylsulfinylethyl group represented by the formula (II):

(II)

wherein R may be the same or different and represents an alkyl group having 1 to 6 carbon atoms or a phenyl group, with the average substitution degree with the hydrocarbylsulfinylethyl group of the formula (II) per glucose unit being at least 0.05, and n is an integer representing the repeating number of the glucose units.

4,694,078

PRODUCTION OF PIGMENTARY COPPER PHTHALOCYANINE

Robert Langley, Glasgow, Scotland; John D. Stewart, Kempton Park, South Africa, and Arthur S. Walls, Kilmarnock, Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 9, 1986, Ser. No. 871,932

Claims priority, application United Kingdom, Jun. 20, 1985, 8515600

Int. Cl.[4] C09B *47/04*

U.S. Cl. 540—141 **13 Claims**

1. An improved process for converting crude copper phthalocyanine (CuPc) to pigmentary CuPc by salt milling, solvent treatment or acid pasting wherein the improvement comprises carrying out the conversion in the presence of 0.5 to 30% by weight, based on the weight of crude CuPc, of crude trichlorophenoxy CuPc, obtained together with CuPc and chlorinated CuPc by replacing from 0.5 to 25% by weight of the phthalic anhydride used to prepare CuPc or chlorinated CuPc by an equivalent amount of 3,4,6-trichloro-5-phenoxy-2-cyanobenzoic acid alkyl or phenyl ester.

4,694,079

3-PROPENYL CEPHALOSPORIN SOLVATES

Leonard B. Crast, Jr., North Syracuse, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

Filed Jul. 29, 1985, Ser. No. 759,805

Int. Cl.[4] C07D *501/22*; A61K *31/545*

U.S. Cl. 540—215 **4 Claims**

1. The crystalline dimethylformamide solvate of 7-[(D)-2-amino-2-(4-hydroxyphenyl)acetamido]-3-((Z)-1-propen-1-yl)-3-cephem-4-carboxylic acid having the composition corresponding to the formula $C_{18}H_{19}N_3O_5S.(C_3H_7NO)_{1.5}$ and the following X-ray powder diffraction pattern.

d(Å)	I/Io
13.24	100
9.50	8
7.82	9
7.42	10
7.14	12
6.76	15
5.88	5
5.28	10
5.06	3
4.82	10
4.72	8
4.64	5
4.53	9
4.47	16
4.39	25
4.29	33
4.10	13
4.04	10
3.69	5
3.62	6
3.58	9
3.56	8

-continued

d(Å)	I/Io
3.48	4
3.29	10
3.19	5
2.98	5
2.71	4.

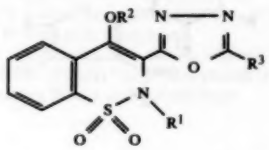
4,694,080

2H-1,2-BENZOTHIAZINE DERIVATIVES

Susumu Nakanishi, and Isao Nagakura, both of Aichi, Japan, assignors to Pfizer Inc., New York, N.Y.

Filed Mar. 19, 1986, Ser. No. 841,509
Claims priority, application Japan, Apr. 16, 1985, 60-80666
Int. Cl.[4] C07D *417/04*; A61K *31/38*
U.S. Cl. 544—49 18 Claims

1. A compound having the formula



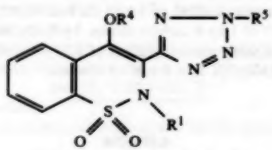
wherein

R^1 is alkyl having from 1 to 8 carbon atoms or $-(CH_2)_m-O-(CH_2)_nOR^6$ where m and n are each an integer from 1 to 4 and R^6 is alkyl having from one to six carbon atoms;

R^2 is hydrogen, alkanoyl having from 2 to 15 carbon atoms, cycloalkylcarbonyl having from 3 to 8 carbon atoms in the cycloalkyl moiety, benzoyl or benzoyl ring substituted with F, Cl, Br, I, CF_3, CH_3, NO_2 or CH_3O; and

R^3 is alkyl having from 1 to 15 carbon atoms, thienyl, furyl, cycloalkyl having from 3 to 8 carbon atoms, phenyl or phenyl substituted with F, Cl, Br, I, CF_3, CH_3 or CH_3O.

10. A compound having the formula



where

R^1 is alkyl having from 1 to 8 carbon atoms or $-(CH_2)_m-O-(CH_2)_n-OR_6$ where m and n are each an integer from 1 to 4 and R^6 is alkyl having from one to six carbon atoms;

R^4 is hydrogen, alkanoyl having from 2 to 15 carbon atoms, benzoyl or benzoyl ring substituted with F, Cl, Br, I, CF_3, CH_3, CH_3O; and

R^5 is hydrogen, alkyl having from 1 to 15 carbon atoms, alkanoyl having from 2 to 15 carbon atoms, alkenyl, aralkenyl cycloakyl of from 3 to 8 carbon atoms, phenylethyl, cycloalkylcarbonyl having from 3 to 8 carbon atoms in the cycloalkyl moiety, benzoyl, benzoyl substituted with F, Cl, Br, I, CF_3, CH_3, CH_3O or NO_2, furylmethyl, thienylmethyl, benzyl or benzyl ring substituted with F, Cl, Br, I, CF_3, CH_3, NO_2 or CH_3O.

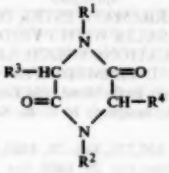
4,694,081

PROCESS TO PREPARE 2,5-DIKETOPIPERAZINES

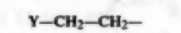
William H. Miller, Glendale, and William D. Taylor, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 23, 1985, Ser. No. 778,817
Int. Cl.[4] C07D *241/08*
U.S. Cl. 544—385 20 Claims

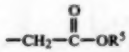
1. A process for the preparation of a substituted or unsubstituted 2,5-diketopiperazine represented by the formula:



where R^3 and R^4 are independently selected from the group consisting of hydrogen, alkyl and aryl, and R^1 and R^2 are independently selected from the group consisting of hydrogen, alkyl having between 1 and about 12 carbon atoms, arylmethyl, aryl,



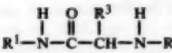
and



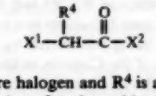
where Y is selected from the group consisting of

and

and R^5 and R^6 are independently selected from the group consisting of alkyl having between 1 and about 6 carbon atoms; the process comprising bringing together under reaction conditions a substituted or unsubstituted glycinamide represented by the formula:



where R^1, R^2 and R^3 are as defined above, and a haloacetyl halide represented by the formula:



where X^1 and X^2 are halogen and R^4 is as defined above, and in the presence of a base forming said substituted or unsubstituted 2, 5-diketopiperazine.

4,694,082

COMPOUND 1,4-DIISOPROPYL-2,5-DIKETOPIPERAZINE

William H. Miller, Glendale, and William D. Taylor, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 23, 1985, Ser. No. 778,818
Int. Cl.[4] C07D *241/08*
U.S. Cl. 544—385 **1 Claim**

1. The compound 1,4-diisopropyl-2,5-diketopiperazine.

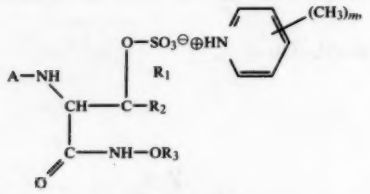
4,694,083

CERTAIN CARBAMATE ESTER DERIVATIVES FORMING SALTS WITH PYRIDINIUM OR PICOLINIUM CATIONS WHICH ARE USEFUL AS INTERMEDIATES

William A. Slusarchyk, Belle Mead, and Tamara Dejneka, Skillman, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 695,775, Feb. 28, 1985, Pat. No. 4,638,061. This application Apr. 28, 1986, Ser. No. 856,527
Int. Cl.[4] C07F *7/02*; C07D *405/02, 213/02*
U.S. Cl. 546—14 **1 Claim**

1. A compound having the formula



wherein, A is benxyloxycarbonyl, p-nitrobenzyloxycarbonyl, t-butyloxycarbonyl, o-nitrophenylsulfenyl or triphenylmethyl;

R_1 and R_2 are the same or different and each is alkyl of 1 to 4 carbons;

R_3 is benzyl, p-nitrobenzyl, benzyloxymethyl, 2-methoxy-2-propyl, 2-ethoxy-2-propyl, tetrahydropyran-2-yl, 2-trimethylsilylethyl, t-butyldimethylsilyl, or t-butyldiphenylsilyl; and

m is 0, 1, 2 or 3.

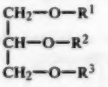
4,694,084

GLYCEROL ETHER PHOSPHATIDES

Manfred Breuninger, Freiburg, Fed. Rep. of Germany, and Dieter Schmidt, Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 8, 1985, Ser. No. 709,871
Claims priority, application Switzerland, Mar. 15, 1984, 1287/84; Feb. 4, 1985, 491/85
Int. Cl.[4] C07F *9/58, 9/65, 9/10*
U.S. Cl. 546—25 **7 Claims**

1. A compound of the formula



I

wherein two of the residues R^1, R^2 and R^3 represent C_{10-30}-alkyl residues with at least 8 C-atoms in a straight chain, at least one of these residues being substituted by at least 2 C_{1-3}-alkyl residues and the sum of the C-atoms in the two residues being greater than 20; and the third residue is a residue —P(O)(O⁻⁻)OR^4 in which R^4 is C_{5-7}-cycloalkyl residue which is substituted by a quaternary ammonium group or a C_{5-7}-cycloalkyl residue which contains a di-(lower-alkyl)-substituted nitrogen atom.

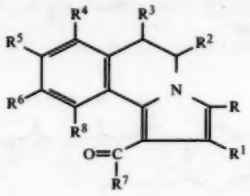
4,694,085

5,6-DIHYDRO-PYRROLO[2,1-A]ISOQUINOLINES AND THE PREPARATION THEREOF

Walter Lösel, Gau-Algesheim; Otto Roos, Schwabenheim, and Gerd Schnorrenberger, Ingelheim am Rhein, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 691,444, Jan. 14, 1985, abandoned. This application Mar. 24, 1986, Ser. No. 843,084
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1984, 3401018
Int. Cl.[4] C07D *491/147, 471/04, 237/28*
U.S. Cl. 546—65 **4 Claims**

1. A compound of the formula



wherein

R, R^2, R^3, and R^7 are each independently hydrogen or alkyl of 1 to 4 carbon atoms;

R^1 is cyano, hydroxycarbonyl, (alkoxy of 1 to 4 carbon atoms) carbonyl, (hydroxy-lower alkyl)-aminocarbonyl, furfuryl-aminocarbonyl, (lower alkoxy-lower alkyl)-aminocarbonyl, (lower alkoxy-phenyl)-lower alkyl-aminocarbonyl or (di-lower alkoxy-phenyl) lower alkyl-aminocarbonyl;

R^4 and R^8 are each independently hydrogen, hydroxyl, alkoxy of 1 to 4 carbon atoms, (alkyl of 1 to 4 carbon atoms)thio or —NR^9R^{10};

R^5 and R^6 are each independently hydroxyl, alkoxy of 1 to 4 carbon atoms or (alkyl of 1 to 4 carbon atoms)thio; or

R^5 and R^6, together with each other, are —O—CH_2—O—, —O—CH_2—CH_2—O— or —O—CH=CH—O—;

R^9 is hydrogen or alkyl of 1 to 4 carbon atoms; and

R^{10} is alkyl of 1 to 4 carbon atoms, hydroxy(alkyl of 1 to 4 carbon atoms), methoxy(alkyl of 1 to 4 carbon atoms) or furfuryl(alkyl of 1 to 4 carbon atoms).

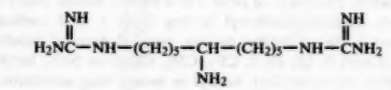
4,694,086

GUANIDINE DERIVATIVES

Hiroshi Morimoto, New York, N.Y., and Akio Ohura, Aichi, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

PCT No. PCT/JP85/00151, § 371 Date Mar. 26, 1986, § 102(e) Date Mar. 26, 1986, PCT Pub. No. WO86/05782, PCT Pub. Date Oct. 9, 1986
PCT Filed Mar. 28, 1985, Ser. No. 848,373
Int. Cl.[4] C07C *129/12*
U.S. Cl. 564—236 **2 Claims**

1. Guanidine derivatives having the following formula (I) and acid adducts thereof.



(I)

4,694,087

IMIDAZOLIDINONE PRECURSORS FOR THE PREPARATION OF BIOTIN

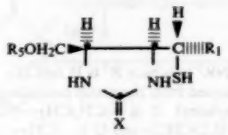
Robert A. Volkmann, Ledyard, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 807,064, Feb. 18, 1986, Pat. No. 4,631,345, which is a division of Ser. No. 587,757, May 17, 1984, Pat. No. 4,581,459, which is a division of Ser. No. 379,247, May 17, 1982, Pat. No. 4,468,516. This application Sep. 22, 1986, Ser. No. 910,116

Int. Cl.[4] C07D *233/34*

U.S. Cl. 548—321 3 Claims

1. A compound of the formula



wherein

X is sulfur or oxygen;

R_1 is $-(CH_2)_4CH_3$, or $-(CH_2)_3OR$ or $-(CH_2)_5OR$ wherein R is alkyl, or $-(CH_2)_4CN$, or $-(CH_2)_4COOR'$ wherein R' is alkyl or phenyl; and

R_5 is —H, —C(O)—R_6 or $-SO_2R_6$ wherein R_6 is alkyl, phenyl, mono- or dialkyl substituted phenyl or camphoryl, said alkyl having from 1 to 4 carbon atoms.

4,694,088

FLUORAN COMPOUNDS

Kazuo Kaneko; Susumu Suzuka; Michihiro Gonda, and Mikiko Kanasugi, all of Tokyo, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP85/00121, § 371 Date Nov. 25, 1985, § 102(e) Date Nov. 25, 1985, PCT Pub. No. WO85/04414, PCT Pub. Date Oct. 10, 1985

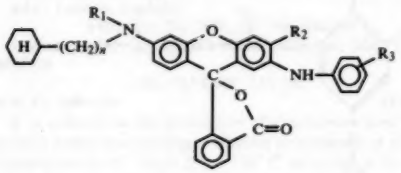
PCT Filed Mar. 12, 1985, Ser. No. 807,037

Claims priority, application Japan, Mar. 24, 1984, 59-55284

Int. Cl.[4] C07D *493/10*

U.S. Cl. 549—226 3 Claims

1. A fluoran compound represented by the general formula (I):



(I)

wherein R_1 represents a cyclohexyl (C_1-C_2) alkyl group; R_2 represents a hydrogen atom, a halogen atom, a lower alkyl group having 1 to 4 carbon atoms; R_3 represents a hydrogen atom, a chlorine atom, a fluorine atom or a lower alkyl group having 1 to 4 carbon atoms; and n is 2.

4,694,089

PROCESS FOR PREPARING PYROMELLITIC DIANHYDRIDE

Tsuneo Kosaka, and Yukio Sakai, both of Kurashiki, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Sep. 2, 1986, Ser. No. 902,528

Claims priority, application Japan, Sep. 10, 1985, 60-198467

Int. Cl.[4] C07D *307/89*

U.S. Cl. 549—239 11 Claims

1. A process for preparing pyromellitic dianhydride by indirect heating of pyromellitic acid with a heating medium, which comprises heating and dehydrating the pyromellitic acid in a solid state while maintaining the temperature of the heating medium not lower than 240° C. until about 80% to about 95% of the acid is converted to the dianhydride, and heating and dehydrating the remaining pyromellitic acid while regulating the temperature of the heating medium between 200° C. and 235° C.

4,694,090

CHROMAN COMPOUNDS USEFUL AS ANALGERICS AND ANTIOXIDANTS

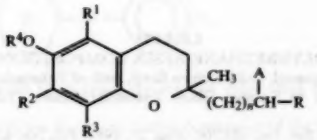
Manzo Shiono; Yoshiji Fujita, and Takashi Nishida, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Dec. 7, 1984, Ser. No. 679,455

Int. Cl.[4] C07D *311/72*

U.S. Cl. 549—407 13 Claims

1. A compound of general formula



where A is an amino or hydroxyl group, R is a hydrogen atom or a hydroxymethyl or carboxyl group when A is an amino group, or a carboxyl group when A is a hydroxyl group, R^1 is a hydrogen atom or a lower alkyl group, R^2 and R^3 are the same or different and each is a hydrogen atom or a lower alkyl or alkoxy group or R^2 and R^3 combinedly represent a —CH=CH—CH=CH— group, R^4 is a hydrogen atom, a carboxylic acyl group, an alkyl group having 1 to 4 carbon atoms, a triphenylmethyl group, a benzyl group or a trimethylsilyl group, and n is an integer of 0–2, or pharmaceutically acceptable salts thereof, or when R is a carboxyl group, the pharmaceutically acceptable esters thereof.

4,694,091

METHOD FOR PREPARING A DIBUTYL TIN DIFLUORIDE POWDER FOR COATING A SUBSTRATE

Jean-Pierre Kerherve, Monthlery, and Armel Queromes, Villebon sur Yvette, both of France, assignors to Saint Gobain Vitrage, Courbevoie, France

Filed Aug. 14, 1985, Ser. No. 765,739

Claims priority, application France, Aug. 22, 1984, 84 13069

Int. Cl.[4] C07F *7/22*

U.S. Cl. 556—104 8 Claims

1. A method for preparing dibutyl tin difluoride which comprises:

reacting dibutyl tin chloride and an ammonium difluoride to form dibutyl tin difluoride;

dissolving the dibutyl tin difluoride in an appropriate solvent to form a solution;

adding a refractory powder having a predetermined particle size to the solution in an amount sufficient to act as a recrystallization initiator;

cooling the solution at a sufficient rate to recrystallize the dibutyl tin difluoride;

washing the recrystallized dibutyl tin difluoride to remove any remaining dibutyl tin chloride or solvent; and

recovering a dibutyl tin difluoride product having spherical grains averaging about 15–25 microns in size which are free of alkaline-earth and alkali impurities.

4,694,092

PARTIALLY HYDROPHILICIZED SILICA GEL AND PROCESS FOR PRODUCING THE SAME

Yasuyo Takahata, and Ryuji Miyagawa, both of Tokyo, Japan, assignors to Chemicals Inspection & Testing Institute, Tokyo, Japan

Filed Dec. 24, 1986, Ser. No. 946,078

Claims priority, application Japan, Dec. 27, 1985, 60-299160; Dec. 27, 1985, 60-299161

Int. Cl.[4] C07F *7/08, 7/18*

U.S. Cl. 556—400 **7 Claims**

1. Partially hydrophilicized silica gel which has hydrophobic groups on the pore inside and silanol groups on the external surface thereof.

4,694,093

POLYURETHANE RESIN COMPOSITION

Masaru Sugimori, and Koichiro Sanji, both of Takatsuki, Japan, assignors to Sunstar Giken Kabushiki Kaisha, Takatsuki, Japan

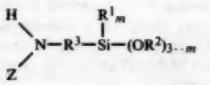
Division of Ser. No. 643,700, Aug. 24, 1984, Pat. No. 4,555,561. This application Oct. 2, 1985, Ser. No. 772,479

Claims priority, application Japan, Sep. 7, 1983, 58-165424

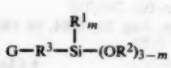
Int. Cl.[4] C07F *7/10*

U.S. Cl. 556—413 **2 Claims**

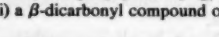
1. An adhesion-promoting agent, which comprises a reaction product of (i) an amine compound prepared by reacting an aminoalkylalkoxysilane of the formula:



wherein R^1 and R^2 are the same or different and are each an alkyl having 1 to 4 carbon atoms, R^3 is a divalent hydrocarbon group having 1 to 4 carbon atoms, Z is hydrogen atom or an aminoalkyl having 1 to 4 carbon atoms, and m is 0, 1 or 2, and less than equimolar amount of an epoxyalkylalkoxysilene compound of the formula:



wherein R^1, R^2, R^3 and m are as defined above, and G is a glycidoxy or epoxycyclohexyl group, with an excess amount of (ii) a β-dicarbonyl compound of the formula:



wherein R^4 and R^5 are the same or different and are each an alkyl having 1 to 16 carbon atoms, an aryl having 6 to 12 carbon atoms, or an alkoxy having 1 to 4 carbon atoms.

4,694,094

CYCLIC DIPHOSPHONITES

Sylvain Juge, Puteaux, and Yvonne Legras, Paris, both of France, assignors to Societe Nationale Elf Aquitaine, France

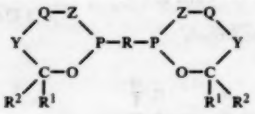
Filed May 21, 1985, Ser. No. 736,447

Claims priority, application France, May 25, 1984, 84 08215

Int. Cl.[4] C07F *9/15*

U.S. Cl. 558—76 **5 Claims**

1. Compound of the formula



where Z is O or NR^7 in which R^7 is H or CH_3; R^1 and R^2 are independently selected from the group consisting of H, methyl, phenyl and nitrophenyl; R is $—CH_2CH_2—$; Y represents a bond or $>CHNHCOCHCl_2$ and Q is $—CH_2—$ or $>CHCH_3$.

4,694,095

PHOSPHORIC ACID DITHIOESTERS, AND INSECTICIDES CONTAINING SAID DITHIOESTERS

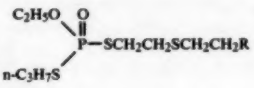
Akinori Kariya, Higashi Murayama; Shukichi Nabekawa, Tokyo; Yoshifusa Hara, Tokyo, and Junji Taguchi, Tokyo, all of Japan, assignors to Hironori Kushibiki and Nippon Chemical Industrial Co., Ltd., both of Tokyo, Japan

Filed Aug. 8, 1986, Ser. No. 894,646

Int. Cl.[4] A01N *57/02*; C07F *9/165*

U.S. Cl. 558—186 **3 Claims**

1. An organo phosphoric acid dithioester represented by the general formula:



(wherein R represents a lower alkylmercapto group, a thiophenyl group or a thioebenzyl group).

4,694,096

(ACYLTHIOPROPYL)PHENOLS

Hans Lehmann, Aesch, and Abdul-Cader Zahir, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

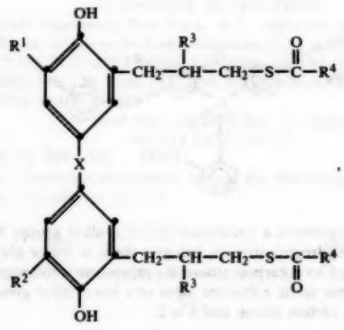
Filed Jan. 28, 1986, Ser. No. 823,230

Claims priority, application Switzerland, Feb. 1, 1985, 452/85

Int. Cl.[4] C07C *153/023*

U.S. Cl. 558—251 **7 Claims**

1. A compound of formula I or II



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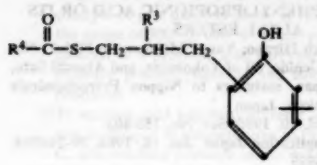
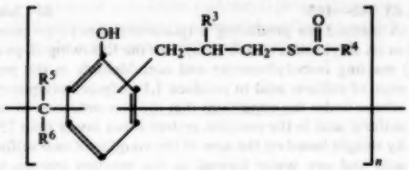
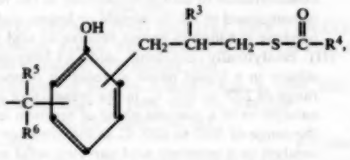


(II)





wherein R^1 and R^2 are each independently of the other hydrogen, C_1–C_8alkyl, cyclohexyl, phenyl, benzyl or tolyl, or are a $—CH_2—$ $CHR^3—CH_2—S—CO—R^4$ radical, R^3 is hydrogen or methyl, R^4 is C_1–C_{18}-alkyl, cyclohexyl, phenyl, benzyl or tolyl, X is $—CR^5R^6—$, —S—, —SO—, $—SO_2—$ or $—(CH_3)C[—(CH_2)_m—COOR^7]—$, in which R^5 and R^6 are each independently of the other hydrogen or C_1–C_6alkyl, R^7 is C_1–C_8alkyl, m is 1 or 2 and n is an integer from 1 to 10.

4,694,097

CARBAMATE ESTER PRODUCTION

Howard Alper, Ottawa, Canada, and David J. H. Smith, Camberley, England, assignors to The British Petroleum Company p.l.c., London, England

Filed Apr. 25, 1986, Ser. No. 856,665

Claims priority, application United Kingdom, May 2, 1985, 8511214

Int. Cl.⁴ C07C *125/065*

U.S. Cl. 560—24 **14 Claims**

1. A process for the production of a carbamate ester which process comprises reacting at ambient temperature or elevated temperature in the range 20° to 150° C. an amine with carbon monoxide and an alcohol in the presence of a protonic acid, a dehydrating agent and a catalyst comprising (a) at least one metal selected from the group of palladium, rhodium, ruthenium, iridium and cobalt, and (b) the metal copper, the components (a) and (b) being in the form of elemental metals or compounds thereof.

4,694,098

COLORLESS LIQUID CRYSTALLINE COMPOUNDS

Yoichi Hirai; Tsunenori Fujii; Kaoru Koto; Kenji Suzuki, all of Soka; Masahiro Yoshida, Saitama; Hisashi Okawa, Kasukabe; Yoshiaki Okabe, Hitachi; Teruo Kitamura, Katsuta; Hisao Yokokura; Shintaroo Hattori, both of Hitachi; Akio Mukoh, Mito, and Mikio Sato, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Kanto Chemical Co., Ltd., both of, Japan

Continuation of Ser. No. 352,019, Feb. 24, 1982, Pat. No. 4,564,694. This application Aug. 2, 1985, Ser. No. 761,885

Claims priority, application Japan, Feb. 25, 1981, 56-25502; Jul. 10, 1981, 56-107074; Nov. 18, 1981, 56-183763; Nov. 18, 1981, 56-183764

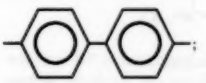
Int. Cl.⁴ C07C *179/00, 69/76, 69/74;* **C09K** *19/32, 19/30, 19/20*

U.S. Cl. 560—59 **5 Claims**

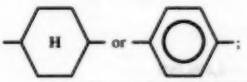
1. A colorless liquid crystalline compound of the formula:

$$R^1—A—B—R^2$$

wherein R^1 is $—(CH_2)_nOC_mH_{2m+1}$ wherein n is an integer of 1 to 8; and m is an integer of 1 to 12; A is



B is

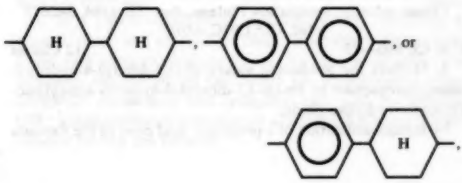


and R^2 is an alkyl group having not more than 12 carbon atoms.

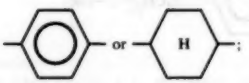
4. A colorless liquid crystalline compound of the formula:

$$R^5OCH_2—A''—COO—B''—R^4$$

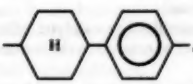
wherein R^4 and R^5 are independently a straight-chain or branched-chain alkyl group having 12 or less carbon atoms; when A'' is



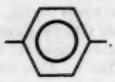
then B'' is



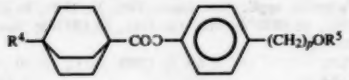
and when A'' is



then B'' is



5. A colorless liquid crystalline compound of the formula:



wherein R^4 and R^5 are independently a straight-chain or branched-chain alkyl group having 12 or less carbon atoms and p is an integer of 1 to 6.

4,694,099

PROCEDURE FOR PRODUCING STEARYL-β-(3,5-DIBUTYL-4-HYDROXYPHENYL) PROPIONATE AND BIS-(β(3,5-DIBUTYL-4-HYDROXYBENZYL)-METHYL-CARBOXYETHYL)SULPHIDE

Matts Ahlfors, Espoo; Salme Koskimies, Helsinki; Leila Lahtinen, Helsinki, and Peter Idelman, Helsinki, all of Finland, assignors to Neste Oy, Finland

PCT No. PCT/FI85/00063, § 371 Date Feb. 20, 1986, § 102(e) Date Feb. 20, 1986, PCT Pub. No. WO86/00301, PCT Pub. Date Jan. 16, 1986

PCT Filed Jun. 28, 1985, Ser. No. 841,518

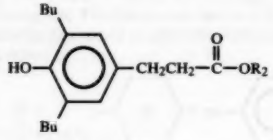
Claims priority, application Finland, Jun. 28, 1984, 842618

Int. Cl.[4] C07C *67/03*

U.S. Cl. 560—75 **12 Claims**

1. Method for producing stearyl-β-(3,5-dibutyl-4-hydroxyphenyl)propionate or bis-(β-3,5-dibutyl-4-hydroxy-benzyl)methylcarboxethyl)sulphide,

by transesterification of a propionic acid ester of the formula



wherein Bu is an n-, secondary, iso- or tertiary butyl group and R_2 is an alkyl group containing 1 to 4 carbon atoms,

which comprises reacting said propionic acid ester with a stearyl alcohol or thiodiglycol

in the presence of a transesterification catalytic effective amount of a titanic acid ester as catalyst in the transesterification,

whereby the transesterification reaction is accelerated to form the corresponding propionate or sulphide.

4,694,100

METHOD FOR PRODUCING α-(P-ISOBUTYLPHENYL)PROPIONIC ACID OR ITS ALKYL ESTERS

Isoo Shimizu; Ryotaro Hirano; Yasuo Matsumura; Hideki Nomura; Kazumichi Uchida, all of Yokohama, and Atsushi Sato, Tokyo, all of Japan, assignors to Nippon Petrochemicals Company, Ltd., Tokyo, Japan

Filed Jul. 10, 1985, Ser. No. 753,403

Claims priority, application Japan, Jul. 14, 1984, 59-146594; Jul. 14, 1984, 59-146595

Int. Cl.[4] C07C *51/29, 51/14, 67/38*

U.S. Cl. 560—105 **33 Claims**

1. A method for producing α-(p-isobutylphenyl)-propionic acid or its alkyl esters which comprises the following steps of:

(I) reacting isobutylbenzene and acetaldehyde in the presence of sulfuric acid to produce 1,1-bis(p-isobutylphenyl) ethane under the conditions that the concentration of said sulfuric acid in the reaction system is not lower than 75% by weight based on the sum of the weights of said sulfuric acid and any water formed in the reaction system, the concentration of said acetaldehyde in the reaction system is maintained at 1% by weight or lower, and said isobutylbenzene is added in excess relative to said acetaldehyde;

(II) catalytically cracking said 1,1-bis(p-isobutylphenyl) ethane in a liquid phase at reaction temperatures in the range of 200° to 350° C. in the presence of a protonic acid catalyst or in a gaseous phase at reaction temperatures in the range of 300° to 650° C. in the presence of a solid acid catalyst or a protonic acid carrying-solid acid catalyst to produce p-isobutylstyrene and isobutylbenzene as main products; and

(III) reacting said p-isobutylstyrene with carbon monoxide and water or alcohol at temperatures in the range of 40° to 150° C. at a carbon monoxide pressure in the range of 30 to 400 kg/cm^2 in the presence of a metal complex carbonylation catalyst to produce α-(p-isobutylphenyl)-propionic acid or its alkyl ester.

19. A method for producing α-(p-isobutylphenyl)-propionaldehyde which comprises the following steps of:

(I) reacting isobutylbenzene and acetaldehyde in the presence of sulfuric acid to produce 1,1-bis (p-isobutylphenyl) ethane under the condition that the concentration of said sulfuric acid in the reaction system is not lower than 75% by weight based on the sum of the weights of sulfuric acid and any water formed in the reaction system, the concentration of said acetaldehyde in the reaction system is maintained at 1% by weight or lower, and said isobutylbenzene is added in excess relative to said acetaldehyde;

(II) catalytically cracking said 1,1-bis(p-isobutylphenyl) ethane in a liquid phase at reaction temperatures in the range of 200° to 350° C. in the presence of a protonic acid catalyst or in a gaseous phase at reaction temperatures in the range of 300° to 650° C. in the presence of a solid acid catalyst or a protonic acid carrying-solid acid catalyst to produce p-isobutylstyrene and isobutylbenzene as main products; and

(III) reacting said p-isobutylstyrene with carbon monoxide and hydrogen at temperatures in the range of 40° to 150° C. at a reaction pressure in the range of 5 to 500 kg/cm^2 in the presence of a metal complex carbonylation catalyst to produce α-(p-isobutylphenyl)-propionaldehyde.

20. A method for producing α-(p-isobutylphenyl)propionic acid which comprises the following steps of:

(I) reacting isobutylbenzene and acetaldehyde in the presence of sulfuric acid to produce 1,1-bis(p-isobutylphenyl) ethane under the conditions that the concentration of said sulfuric acid in the reaction system is not lower than 75% by weight based on the sum of the weights of said sulfuric acid and any water in the reaction system, the concentration of said acetaldehyde in the reaction system is maintained at 1% by weight or lower, and said isobutylbenzene is added in excess relative to said acetaldehyde.

(II) catalytically cracking said 1,1-bis(p-isobutylphenyl)

ethane in a liquid phase at reaction temperatures in the range of 200° to 350° C. in the presence of a protonic acid catalyst or in a gaseous phase at reaction temperatures in the range of 300° to 650° C. in the presence of a solid acid catalyst or a protonic acid carrying-solid acid catalyst to produce p-isobutylsytrene and isobutylbenzene as main products;

(III) reacting said p-isobutylstyrene with carbon monoxide and hydrogen at temperatures in the range of 40° to 150° C. at a reaction pressure in the range of 5 to 500 kg/cm^2 in the presence of a metal complex carbonylation catalyst to produce α-(p-isobutylpheneyl)-propionaldehyde; and

(IV) oxidizing said α-(p-isobutylphenyl)propionaldehyde to produce α-(p-isobutylphenyl) propionic acid.

4,694,101

PROCESS FOR SEPARATING METHYL ISOCYANATE

George E. Heinsohn, Elkton, Md., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 639,083, Aug. 9, 1984. This application Mar. 27, 1986, Ser. No. 844,958

Int. Cl.^{4} C07C *141/00*

U.S. Cl. 560—352 **6 Claims**

1. A process for separating methyl isocyanate from a gas-phase mixture containing methyl isocyanate and water vapor comprising, in order

(a) diluting the gas-phase mixture by addition of an inert, noncondensable gas, such that the dew point of the methyl isocyanate in the mixture is lowered to about −5° C. to 5° C.;

(b) removing a portion of the water vapor by cooling the mixture to a temperature which is about 5°-10° C. above the dew point of the methyl isocyanate in the mixture, to condense the water vapor;

(c) removing essentially all the remaining water vapor from the gas-phase mixture by passing the mixture over or through a water-absorbing material; and

(d) liquefying the methyl isocyanate.

4,694,102

CALCIUM CARBOXYLATE PHENOL DERIVATIVE

Akiyoshi Oonishi; Kenji Tanaka, both of Yokkaichi; Makoto Tadeka, Ami; Kazuhiko Konno, Ami, and Masaki Saito, Ami, all of Japan, assignors to Mitsubishi Yuka Fine Chemicals Co., Ltd., Tokyo, Japan

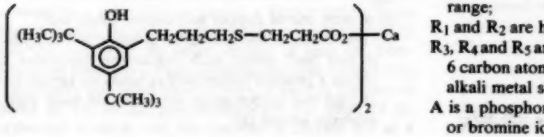
Division of Ser. No. 584,636, Feb. 29, 1984, Pat. No. 4,633,008. This application May 23, 1986, Ser. No. 866,280

Claims priority, application Japan, Mar. 15, 1983, 58-42694; Jul. 6, 1983, 58-122568

Int. Cl.^{4} C07C *149/20*

U.S. Cl. 562—426 **1 Claim**

1. A phenol derivative of the formula



4,694,103

METHOD OF PREPARING N-ACRYLOYL-α-AMINO ACIDS

Larry R. Krepski, White Bear Lake; Howell K. Smith, II, Lauderdale; Jerald K. Rasmussen, Stillwater, and Steven M. Heilmann, N. St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 19, 1986, Ser. No. 865,190

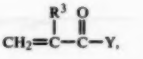
Int. Cl.^{4} C07C *99/10*

U.S. Cl. 562—450 **15 Claims**

1. A process for providing an N-acryloyl-α-amino acid comprising the steps:

(i) reacting a ketone having alkyl, aryl, or arenyl groups, or combinations of these groups, said ketone having 3 to 53 carbon and heteroatoms which can include up to 7 N, S,and O heteroatoms, an ammonium salt, and an alkali metal cyanide, in water, to provide an aminonitrile,

(ii) acryloylating the resulting aminonitrile with an acryloylating agent having the formula,



wherein R^3 is hydrogen or methyl and Y is chloride, methacryloyloxy, or acryloyloxy, in aqueous media to provide an acrylaminodonitrile, and

(iii) hydrolyzing the resulting acrylamidonitrile in aqueous acid to provide said N-acryloyl-α-amino acid.

4,694,104

PHASE TRANSFER CATALYSTS

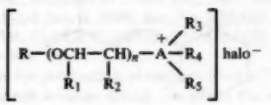
Paritosh M. Chakrabarti, Cedar Grove; Sureshchandra G. Desai, Wayne, and Lindley S. Wood, Jr., Montclair, all of N.J., assignors to GAF Corporation, Wayne, N.J.

Filed Aug. 9, 1982, Ser. No. 406,755

Int. Cl.^{4} C07C *91/26*

U.S. Cl. 564—285 **11 Claims**

1. In a liquid/liquid phase reaction process involving an organic phase and an aqueous phase, insoluble in said organic phase, said aqueous phase containing an aqueous solution of an inorganic salt having an OH^- anion the improvement which comprises contacting said inorganic salt with an effective OH^- anion exchanging amount of a quaternized phase transfer catalyst having the formula



wherein

R is alkyl having 8 to 30 carbon atoms, blends thereof or alkyl-substituted phenyl of 10 to 24 carbon atoms;

n has a value of from 2 to 14 and includes mixtures within said range;

R_1 and R_2 are hydrogen atoms or one of R_1 and R_2 is methyl;

R_3, R_4 and R_5 are independently hydrogen, alkyl radical of 1 to 6 carbon atoms or phenyl or one of R_3, R_4 and R_5 is β-ethyl-alkali metal sulfonate;

A is a phosphorous or a nitrogen atom; and halo is a chlorine or bromine ion.

4,694,105

HERBICIDAL ALKOXYAMINO- AND POLYALKOXYAMINODIPHENYL ETHERS

Dieter Dürr, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

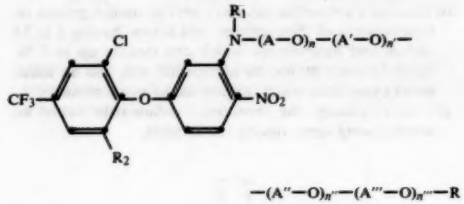
Filed Dec. 10, 1984, Ser. No. 679,860

Claims priority, application Switzerland, Dec. 20, 1983, 6758/83

Int. Cl.⁴ C07C *93/14, 149/42*

U.S. Cl. 564—430 **10 Claims**

1. A diphenyl ether of the formula



wherein:

each of A, A′, A″ and A‴ is an identical or different C_1–C_4-alkylene radical which may be straight-chain or branched;

n is a value of from 1 to 5;

each of n′, n″ and n‴ is a value of from 0 to 5;

the sum of n+n′+n″+n‴ is equal to or greater than 3;

R is hydrogen or a C_1–C_4-alkyl radical unsubstituted or substituted by halogen;

R_1 is hydrogen or a C_1–C_4-alkyl, C_1–C_4-hydroxyalkyl or C_2–C_8-alkoxyalkyl; and

R_2 is hydrogen, chlorine or fluorine.

4,694,106

METHYLTHIOIONENE DERIVATIVES AND USE THEREOF IN AUGMENTING OR ENHANCING THE AROMA OR TASTE OF FOODSTUFFS

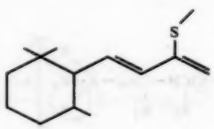
Alan O. Pittet, Atlantic Highlands; Ranya Muralidhara, Fair Haven; Manfred H. Vock, Locust; Kevin P. Miller, Middletown, and Domenick Luccarelli, Jr., Neptune, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 768,726, Aug. 23, 1985, Pat. No. 4,599,237. This application Mar. 7, 1986, Ser. No. 837,145

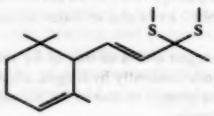
Int. Cl.⁴ C07C *149/26*

U.S. Cl. 568—38 **3 Claims**

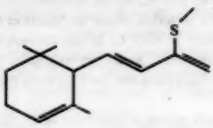
1. The methylthioionene derivative having the structure:



2. The methylthioionene derivative having the structure:



3. The methylthioionene derivative having the structure:



4,694,107

PREPARATION OF KETONES BY ISOMERIZATION OF ALDEHYDES

Wolfgang Hoelderich; Franz Merger; Wolf D. Mross, all of Frankenthal, and Rolf Fischer, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 730,676, May 3, 1985, abandoned. This application Jul. 2, 1986, Ser. No. 865,007

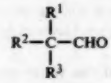
Claims priority, application Fed. Rep. of Germany, May 24, 1984, 3419378

Int. Cl.⁴ C07C *45/67*

U.S. Cl. 568—310 **13 Claims**

1. In a process for the preparation of a ketone by isomerization of an aldehyde in the presence of a zeolite catalyst, the improvement which comprises:

converting into said ketone an aldehyde of the formula



I

where R^1 is hydrogen, methyl or ethyl, R^2 is hydrogen or alkyl of 1 to 10 carbon atoms and R^3 is alkyl of 1 to 10 carbon atoms or said alkyl which is substituted by an aryl radical, or further where R^3 is an aryl, cyclopentyl, cyclohexyl or heterocyclic radical, at not more than 600° C. over a zeolite catalyst which is selected from the group consisting of a borosilicate zeolite of the pentasil type and an iron silicate zeolite of the pentasil type.

4,694,108

SYNTHESIS OF HIGHER KETONES

David J. Elliott, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 1, 1986, Ser. No. 891,838

Int. Cl.⁴ C07C *45/72*

U.S. Cl. 568—387 **29 Claims**

1. A process for preparing higher ketones comprising the step of contacting a feed comprising

(a) at least one aliphatic ketone having from 3 to 6 carbon atoms per molecule and

(b) at least one aliphatic aldehyde having from 2 to 6 carbon atoms per molecule with a catalyst composition comprising

(i) at least one of copper and copper oxide and

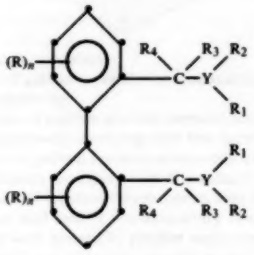
(ii) zinc oxide, in the substantial absence of free hydrogen in said feed, under such contacting conditions as to obtain a product comprising at least one ketone having at least one carbon atom per molecule more than said aliphatic ketone (a).

4,694,109
CHELATE LIGANDS FOR LOW PRESSURE HYDROFORMYLATION CATALYST AND PROCESS EMPLOYING SAME

Thomas J. Devon; Gerald W. Phillips; Thomas A. Puckette; Jerome L. Stavinoha, and Jeffrey J. Vanderbilt, all of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 13, 1986, Ser. No. 873,918
Int. Cl.[4] C07C *45/50*
U.S. Cl. 568—454 **11 Claims**

1. A hydroformylation process comprising contacting at least one olefin having from 2 to 20 carbon atoms in a reaction zone at a temperature of from about 20° C. to about 250° C. and a pressure of from about 50 psig to about 800 psig with hydrogen, carbon monoxide, and a catalyst comprising rhodium in chemical complex with one or more ligands of the formula



wherein:

n is 1–4;

each R is independently selected from hydrogen, alkyl, alkoxy, aryloxy, aryl, aralkyl, alkaryl, alkoxyalkyl, cycloaliphatic, halogen, alkanoyl, alkanoyloxy, alkoxycarbonyl, carboxyl or cyano;

each R_1 and R_2 is independently selected from alkyl, aryl, aralkyl, alkaryl or cycloaliphatic;

each R_3 and R_4 is independently selected from hydrogen and the R_1 substituents;

wherein each alkyl group or moiety is straight or branched chain of 1–20 carbons, each aryl group contains 6–10 ring carbons, and each cycloaliphatic group contains from 4–6 ring carbons; and

each y is independently selected from the elements N, P, As, Sb and Bi;

for a sufficient period of time to permit reaction of said olefin with said carbon monoxide and hydrogen to form aldehyde product.

4,694,110
PROCESS FOR PRODUCTION OF M-PHENOXYBENZYL ALCOHOL

Shinji Takenaka, and Ryu Oi, both of Ohmuta, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed May 9, 1986, Ser. No. 861,414
Claims priority, application Japan, May 13, 1985, 60-99593
Int. Cl.[4] C07C *29/00*
U.S. Cl. 568—638 **3 Claims**

1. Process for producing m-phenoxybenzyl alcohol which comprises reacting chlorobenzene with m-hydroxybenzyl alcohol in the presence of a catalytic amount of a copper complex of 8-hydroxyquinoline and a base, wherein chlorobenzene is added to a polar solvent having a higher boiling point that chlorobenzene, the amount of chlorobenzene being 0.05 to 4.0 times the weight of the polar solvent; at least one compound selected from the group consisting of alkali hydroxides, alkali carbonates and alkali bicarbonates, is used as the base in an amount of 1.0 to 2.0 gram-equivalents per mole of m-hydroxybenzyl alcohol; and the reaction is carried out at a temperature of 140° to 200° C. while removing the generated water as an azeotrope with chlorobenzene.

4,694,111
ALKOXYALKYLATION OF PHENOL

Balaram B. G. Gupta, North Plainfield, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Jul. 9, 1986, Ser. No. 883,675
Int. Cl.[4] C07C *41/01*
U.S. Cl. 568—662 **16 Claims**

1. A process for the production of a 1-hydroxy-2-(1'-lower alkoxyalkyl) benzene by reaction of phenol with a lower acetal or ketal comprising contacting a feed stream comprising said phenol and lower acetal or ketal at an elevated temperature with a protonated ZSM-5 zeolite as catalyst.

4,694,112
PROCESS FOR PRODUCING 2,2,2-TRIFLUOROETHANOL

Heinrich Willenberg, Garbsen; Wilhelm Pohlmeyer, and Werner Rudolph, both of Hanover, all of Fed. Rep. of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Mar. 10, 1986, Ser. No. 837,824
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1985, 3510883
Int. Cl.[4] C07C *31/38*
U.S. Cl. 568—842 **15 Claims**

1. A process for producing 2,2,2-trifluoroethanol by catalytic hydrogenation of 2,2,2-trifluoroethyl trifluoroacetate with elemental hydrogen in the gaseous phase at a reaction temperature of at least 100° C. and less than 210° C. in the presence of an oxide catalyst comprising oxides of zinc and copper, the sum of all oxides being set at 100 percent and the weight ratio of chromium oxide to the total of the oxide materials being from 0 to 0.05:1.

4,694,113
DUAL CATALYST SEQUENTIAL METHOD FOR PRODUCTION OF SORBITOL FROM HYDROLYZED STARCH SOLUTION

George J. Gauthier, Groton, and John D. Miceli, New London, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Jun. 4, 1986, Ser. No. 870,462
Int. Cl.[4] C07C *29/132, 29/14, 31/26*
U.S. Cl. 568—863 **13 Claims**

1. A process for production of sorbitol from a 50 to 98.5 DE hydrolyzed starch solution which comprises the steps of

(a) hydrogenation of said hydrolyzed starch solution in the presence of a catalytic amount of nickel at a pH in the range of 3.0 to 7.0, at 120° to 160° C. and a pressure of from 500 to 2000 psig (35 to 140 bars), until the reducing sugar content of the mixture is below 5 percent;

(b) removal of nickel catalyst and acidification of the resulting solution to a pH in the range of 1.0 to 2.5;

(c) hydrogenation of the acidified solution in the presence of a catalystic amount of ruthenium at 100° to 180° C. and a pressure of from 500 to 2000 psig (35 to 140 bars) until hydrogen uptake is substantially complete, and removal of said ruthenium.

4,694,114

PROCESS FOR ISOMERIZING ALKYL AROMATIC HYDROCARBONS UTILIZING ZSM-23 ZEOLITE AND A HYDROGENATION/DEHYDROGENATION METAL

Yung-Feng Chu, Cherry Hill, N.J., and James C. Vartuli, West Chester, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 766,687, Aug. 19, 1985, abandoned, which is a continuation of Ser. No. 569,827, Jan. 11, 1984, abandoned. This application Jul. 14, 1986, Ser. No. 885,319

Int. Cl.[4] **C07C** *5/22*

U.S. Cl. 585—481 **6 Claims**

1. A process for producing a near equilibrium mixture of xylenes from a feed comprising ethylbenzene and mixed xylenes which comprises contacting the feed with hydrogen in the presence of a catalyst composition consisting essentially of 0.1 to 1 weight percent of a hydrogenation/dehydrogenation metal, 5 to 97 weight percent alumina and 3 to 80 weight percent ZSM-23 zeolite

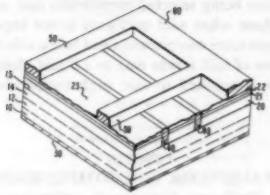
wherein catalyst contact with the feed is undertaken at a weight hourly space velocity of 0.5 to 15 based on the catalyst, a pressure of from between 0 to 1000 psig and a temperature of from between 600° F. and 900° F., and

wherein ZSM-23 is steamed prior to hydrogenation/dehydrogenation metal incorporation into the catalyst composition.

4,694,115
SOLAR CELL HAVING IMPROVED FRONT SURFACE METALLIZATION

David R. Lillington, Van Nuys; Nick Mardesich, Simi Valley; Hans G. Dill, Newhall, and George F. J. Garlick, Los Angeles, all of Calif., assignors to Spectrolab, Inc., Sylmar, Calif.

Filed Nov. 4, 1986, Ser. No. 927,282
Int. Cl.[4] H01L *31/06*
U.S. Cl. 136—256 7 Claims



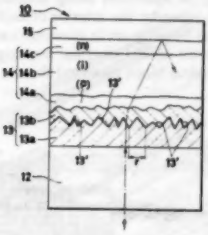
1. A solar cell comprising:
a first layer of gallium arsenide semiconductor material of an N+ conductivity;
a second layer of gallium arsenide semiconductor material of an N conductivity overlying said first layer;
a third layer of gallium arsenide semiconductor material of a P conductivity overlying said N conductivity layer and forming a P-N junction therebetween, said P conductivity thrid layer and said N+ conductivity first layer having front and back essentially parallel major surfaces, respectively, which are essentially parallel to said P-N junction;
a layer of aluminum gallium arsenide semiconductor material of a p conductivity overlying said front major surface of said P conductivity third layer and having an exposed surface essentially parallel to said front major surface and at least one edge;
a plurality of metallic contact lines made of a first metal alloy composition and being spaced apart by a first predetermined distance traversing said exposed surface and extending through said aluminum gallium arsenide layer to said front major surface and making electrical contact to said third layer;
a plurality of longitudinally disposed metallic grid lines made of a second metal alloy composition and being spaced apart by a second predetermined distance located on said exposed surface of said aluminum gallium arsenide layer and which cross said metallic contact lines and make electrical contact to said metallic lines;
a flat metallic strip disposed on said aluminum gallium arsenide layer exposed surface near said edge, said strip electrically coupling said metallic grid lines to one another; and
a back contact located on said back major surface.

4,694,116
THIN-FILM SOLAR CELL

Yutaka Hayashi, Ibaraki; Toshio Mishuku, Gunma; Mitsuyuki Yamanaka, Ibaraki, and Hideyo Iida, Takasaki, all of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry and Taiyo Yuden Co., Ltd., both of Tokyo, Japan

Filed Mar. 21, 1986, Ser. No. 842,210
Claims priority, application Japan, Mar. 22, 1985, 60-56165
Int. Cl.[4] H01L *31/06*
U.S. Cl. 136—256 15 Claims

1. A thin-film solar cell, comprising:
a transparent substrate;
a transparent electrode formed on the transparent substrate which is constituted of a first layer in contact with the transparent substrate and a second layer formed on said first layer;
a photoelectric conversion section formed on said second layer of said transparent electrode; and
a light-reflective back electrode formed on the photoelectric conversion section,
said first layer of the transparent electrode being formed of crystal grains having a relatively large average grain

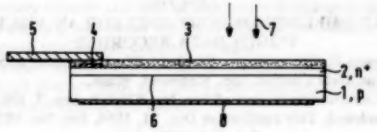


diameter such that said first layer presents a rough upper surface having a plurality of sharply tipped points and said second layer is formed of crystal grain having a relatively smaller average grain diameter on said first layer and is of sufficient thickness such that the upper surface of said first layer is rounded by the provision thereon of said second layer.

4,694,117
SOLAR CELL

Gerda Friedrich, Unterheinriet; Klaus-Dieter Rasch, Nordheim, and Wilfried Schmidt, Talheim, all of Fed. Rep. of Germany, assignors to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed May 1, 1986, Ser. No. 858,173
Claims priority, application Fed. Rep. of Germany, May 4, 1985, 3516117
Int. Cl.[4] H01L *31/06*
U.S. Cl. 136—256 6 Claims



1. Solar cell comprising a semiconductor body (1, 2) containing a pn-junction (6), said body being provided with a reflection-reducing layer (3) on the surface intended for incident light (7) and having a rear contact (8) on the opposite surface, wherein at least one front interconnector (5) is directly applied to the reflection-reducing layer (3) of insulating material, so that the charge carriers pass from the semiconductor body (1, 2) to the front interconnector (5) by tunnelling through the reflection-reducing layer (3).

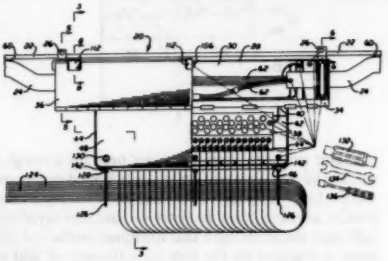
4,694,118
AERIAL TERMINAL FOR TELECOMMUNICATION CABLES

Gunter P. Schmidt, Spring Hill, Fla., assignor to G-A-T-M Corporation, Brooksville, Fla.

Filed Oct. 10, 1985, Ser. No. 786,461
Int. Cl.[4] H02G *15/10, 7/06*
U.S. Cl. 174—41 32 Claims

1. An aerial terminal for telecommunication cables, said aerial terminal comprising: a splicing housing defined by an enclosure dimensioned and configured to receive a first seg-

ment of a telecommunication cable therein; a plurality of clamping means attached to the exterior of said splicing housing whereby said aerial terminal may be suspended from a second segment of the telecommunication cable; a terminal housing depending from said splicing housing, said terminal housing being defined by a box the top of which is congruent with at least a portion of said enclosure defining said splicing housing, a plurality of apertures being formed through said congruent portions whereby the interior of said splicing housing and said terminal housing are in communicating relation to each other, the interior of said terminal housing having a telecommunication terminal block mounted therein whereby pairs



of telephone wires contained within the first segment of the telecommunication cable may be operatively connected to subscriber drop wires; said aerial terminal further comprising a plurality of drop wire slots formed through said terminal housing box and a plurality of wire straps depending from said terminal housing box to receive and support subscriber drop wires; both said splicing housing and said terminal housing having hinged covers thereon whereby access to the interior of each of said housings may be obtained; said splicing housing further comprising at least a pair of sealing sleeves for surrounding the first segment of the telecommunication cable, one of said sleeves being disposed at each end of said splicing housing enclosure.

4,694,119

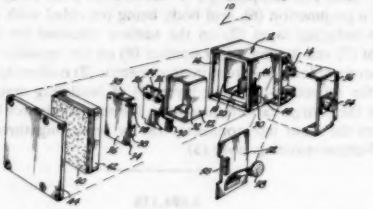
HEAT SHIELDED MEMORY UNIT FOR AN AIRCRAFT FLIGHT DATA RECORDER

Johannes B. Groenewegen, Kirkland, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Continuation-in-part of Ser. No. 529,831, Sep. 7, 1983, abandoned. This application Dec. 31, 1984, Ser. No. 687,910

Int. Cl.[4] H05K *5/04*

U.S. Cl. 174—52 PE **4 Claims**



1. An enclosure for thermally protecting one or more heat sensitive items from a high temperature environment, said enclosure comprising:

a metal outer housing including an interior cavity for containing said one or more heat sensitive items;

a first thermal insulator configured as a thermal liner that extends about the surface of said first interior cavity, said thermal liner defining a second interior cavity with said one or more heat sensitive items being spaced apart from the walls of said second interior cavity said first thermal insulator being a solid material and remaining solid when said enclosure is exposed to a high temperature environment; and

an amide wax, said wax occupying at least a portion of said interior cavity and encapsulating said one or more heat sensitive items said amide wax exhibiting a phase transition at a predetermined temperature, said predetermined temperature being selected to maintain said amide wax in a solid phase when said enclosure is not exposed to said high temperature environment and being selected to allow conversion of said amide wax to a liquid phase when said enclosure is exposed to said high temperature environment.

4,694,120

FRAMEWORK FOR COMPONENTS

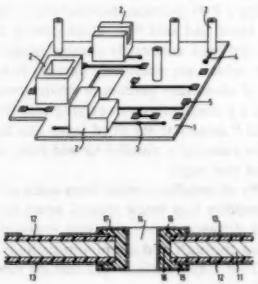
Jan F. Accou, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 1, 1985, Ser. No. 793,872

Claims priority, application Netherlands, Nov. 27, 1984, 8403596

Int. Cl.[4] H05K *1/00*

U.S. Cl. 174—68.5 **3 Claims**



1. A framework for components in an electrical or mechanical apparatus comprising

a mounting plate comprising a metal plate covered on opposed major surfaces with electrically insulating layers having conductor patterns superimposed thereon,

at least one synthetic resin mounting projection molded on one side of said mounting plate, said projection being secured to said mounting plate by synthetic resin molded through at least one respective hole in said plate to engage the opposite side,

synthetic resin eyelets molded in holes through said mounting plates, each eyelet having two integral flanges, one said flange molded against each major surface of said board, said eyelets being connected to at least one mounting projection by at least one runner of synthetic resin, said mounting projection and said eyelets being integrally molded.

4,694,121

PRINTED CIRCUIT BOARD

Masuaki Ota, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 10, 1986, Ser. No. 929,396

Claims priority, application Japan, Nov. 8, 1985, 60-248710

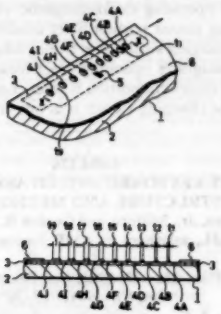
Int. Cl.[4] H05K *3/34*

U.S. Cl. 174—68.5 **6 Claims**

1. A printed circuit board comprising:

an electrically insulative substrate;

an electroconductive layer formed on said electrically insulative substrate; and



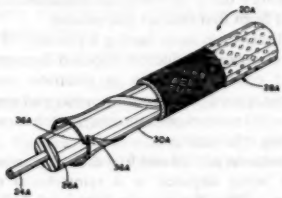
a resist layer formed on said electroconductive layer and having a row of openings, distances between adjacent openings increasing from one end to another end of said row.

4,694,122

FLEXIBLE CABLE WITH MULTIPLE LAYER METALLIC SHIELD

Leonard J. Visser, Batavia, Ill., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Mar. 4, 1986, Ser. No. 835,978
Int. Cl.⁴ H01B 7/18
U.S. Cl. 174—106 R **18 Claims**



1. A flexible shielded cable comprising:
an elongate, flexible metal conductor;
a layer of a flexible dielectric material disposed about said conductor; and
a flexible metallic shield disposed about said layer, said shield including a copper foil having overlapping edges, a copper braid about the foil, and a layer of metal which closes any opening between said overlapping edges, bonds said braid and said foil and closes the interstices of said braid whereby said shield is flexible and has no openings therein.

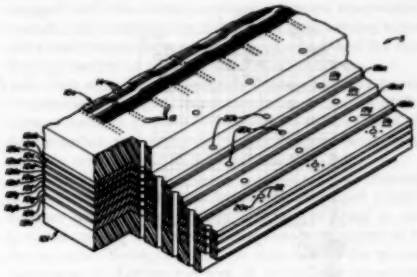
17. A method of forming a metallic shield about a flexible metal conductor encompassed by a layer of dielectric material to form a flexible coaxial cable, said method comprising:
wrapping a copper foil about said layer of dielectric material so that said foil has overlapping edges;
applying a copper braid over said foil; and
passing the braided cable through a bath of a molten metal which bonds to said braid and said foil so that any opening between said edges of said foil is closed and the interstices of said braid are closed.

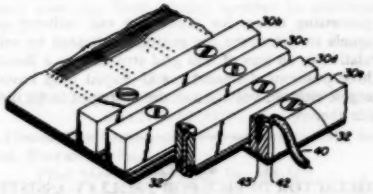
4,694,123

BACKPLANE POWER CONNECTOR SYSTEM

Edwin M. Massey, San Jose, Calif., assignor to ELXSI, San Jose, Calif.

Filed Jan. 13, 1982, Ser. No. 339,034
Int. Cl.⁴ H01B 7/08
U.S. Cl. 174—117 FF **9 Claims**





1. In a backplane power distribution system having a laminated series of circuit boards comprising, in order, a first conductive layer, a first dielectric layer, a second conductive layer, and a second dielectric layer, the improvement wherein
said second conductive and dielectric layers extend transversely beyond said first conductive and dielectric layers to define a substantial extended exposed flat surface portion of said second conductive layer,
the improvement further comprising a rectangular bus bar in direct contact with said flat surface portion to facilitate electrical connection thereto.

4,694,124

DIGITIZING TABLET SYSTEM INCLUDING A TABLET HAVING A GRID STRUCTURE MADE OF TWO ORTHOGONAL SETS OF PARALLEL UNIFORMLY SIZED AND SPACED U SHAPED LOOPS OF CONDUCTIVE MATERIAL

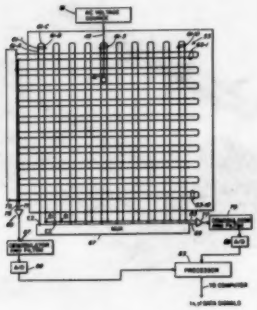
Barry Blesser, Raymond, N.H., assignor to Pencept, Inc., Waltham, Mass.

Continuation of Ser. No. 592,879, Mar. 23, 1984, Pat. No. 4,582,955. This application Dec. 9, 1985, Ser. No. 790,883
The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.
Int. Cl.⁴ G08C 21/00
U.S. Cl. 178—19 **11 Claims**

1. A digitizing tablet system comprising:
a. a housing having a two dimensional work surface,
b. a grid structure in said housing, said grid structure including a first plurality of spaced parallel U-shaped conductive loop elements equal in size disposed in a plane parallel to said work surface and defining a first coordinate axis and a second plurality of spaced parallel U-shaped conductive loop elements equal in size disposed in a plane parallel to said work surface and defining a second coordinate axis,

c. a magnetizable coil indicating a position relative to said first and second coordinate axes of said grid structure,

d. means for providing an alternating voltage signal to energize said magnetizable coil so as to produce by electromagnetic induction voltage signals in the loop elements of said grid structure related to the position indicated by said coil relative to the axes of said grid structure, and



e. processing means for processing said induced voltage signals to determine the position indicated by said coil relative to an axis of said grid structure as a function of three positions defined by a U-shaped loop having the largest induced voltage and the U-shaped loops on either side thereof.

4,694,125

COLLECTOR DEVICE FOR TROLLEY-ASSISTED VEHICLES

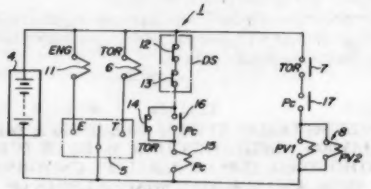
Hidetoshi Takei, Ayase, and Teruo Minami, Kawasaki, both of Japan, assignors to Toyo Denki Seizo Kabushiki Kaisha and Komatsu Ltd., Tokyo, Japan

Filed Jul. 17, 1986, Ser. No. 887,564

Claims priority, application Japan, Jul. 22, 1985, 60-160322; Jul. 22, 1985, 60-160323

Int. Cl.[4] B60L *5/00, 5/04*

U.S. Cl. 191—87 **6 Claims**



1. Collector device for trolley-assisted vehicles comprising a pantograph operating circuit having a mode changing switch for switching trolley mode and non-trolley mode, a pantograph operating electromagnetic valve being energized in the trolley mode of the mode changing switch and deenergized in the non-trolley mode, and a battery for supplying the pantograph operating electromagnetic valve, the vehicle can be driven by a power fed from overhead contact system collected by pantographs being operated into working position to contact with the overhead contact system by energization of the pantograph operating electromagnetic valve and to leave the overhead contact system at deenergization of the valve by a pantograph controlling mechanism, characterized in that the pantograph operating circuit comprises;

a first switching circuit portion being set when a door switch corelated to doors of the vehicle is in closed condition and the mode changing switch is in non-trolley mode, and being reset when the mode changing switch is in trolley mode and the door switch is in open condition, and

a second switching circuit portion which energizes the pantograph operating electromagnetic valve when the first switching circuit portion is set condition and the trolley mode changing switch is in trolley mode, and deenergizes said pantograph operating electromagnetic valve when the first switching portion is reset condition and the trolley mode changing switch is in non-trolley mode.

4,694,126

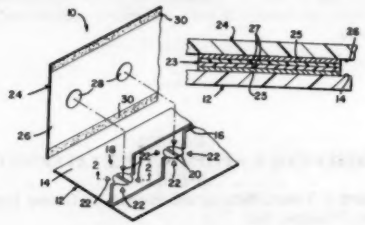
MEMBRANE KEYBOARD SWITCH ASSEMBLY HAVING SPACER STRUCTURE AND METHOD OF MAKING

Hugh H. Aiken, Jr., Milford, and Gordon B. Langford, Amherst, both of N.H., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 29, 1986, Ser. No. 868,822

Int. Cl.[4] H01H *13/70*

U.S. Cl. 200—5 A **20 Claims**



1. A membrane switch comprising:

a first dielectric layer having a plurality of first elongated electrical conductors disposed thereon, each of said first conductors being in electrical communication with but spaced from first contact pad means;

a second dielectric layer having a plurality of second elongated electrical conductors disposed thereon, each of said second conductors being in electrical communication with but spaced from second contact pad means, said first and second contact pads forming switch sites when placed in facing relationship;

spacer means as part of said first dielectric layer, said spacer means being disposed in a symmetrical discontinuous pattern around but remote from said first contact pad means, said spacer means normally maintaining said first and second contact pad means spaced from each other at said switch sites and permitting electrical engagement there between upon application of an actuation force to said switch sites;

electrical insulating means disposed between at least one of any opposed first and second conductors when said first and second dielectric layers are assembled to form said membrane switch, said insulating means being spaced from said switch site; and

means for holding said first and second dielectric layers in alignment so that corresponding first and second contact pad means overlie one another at said switch sites.

4,694,127

PRESSURE RESPONSIVE SWITCH ASSEMBLY

Suarawu O. Amuda, Decatur, Ill., assignor to Borg-Warner Automotive, Inc., Troy, Mich.

Filed Jun. 23, 1986, Ser. No. 877,062

Int. Cl.[4] H01H *35/34*

U.S. Cl. 200—83 P **6 Claims**

1. A pressure responsive switch assembly comprising:

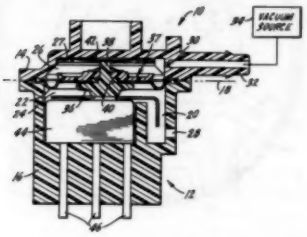
a housing defining an enclosure, a vacuum port and a reference port;

diaphragm-actuator means mounted in said enclosure and cooperating with said housing to define a reference chamber and an actuation chamber;

a source of fluid at a reference pressure communicating with said reference chamber through said reference port;

a source of fluid at a variable vacuum communicating with said actuation chamber through said vacuum port;

disc-shaped means disposed in said actuation chamber separate from but adjacent to said diaphragm-actuator means for maintaining said diaphragm-actuator means at a reference position when said disc-shaped means assumes a first



position, said disc-shaped means being deformable to a second position by said diaphragm-actuator means in response to a predeteremined first fluid differential pressure between said actuation chamber and said reference chamber and being reformable to said first position at a second fluid pressure differential less than said first fluid pressure differential; and

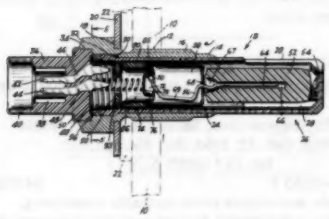
operative switch means disposed in said reference chamber as an assembly which is responsive to position changes of but is independently mounted from said diaphragm-actuator means and disc-shaped means and which is protected from variable vacuum fluid contamination by said diaphragm actuator means.

4,694,128

FLOAT SWITCH CONSTRUCTION FOR MONITORING LIQUID LEVELS

Peter J. Lupoli, Hamden, and Donald J. Mattis, Norwalk, both of Conn., assignors to Casco Products Corporation, Bridgeport, Conn.

Filed Jul. 7, 1986, Ser. No. 882,945
Int. Cl.[4] H05K *35/18*
U.S. Cl. 200—84 R **23 Claims**



1. A float switch construction for monitoring liquid levels, comprising in combination:

(a) an elongate float housing having an axis, and having an aperture to permit the liquid to enter the interior thereof, said housing being adapted for mounting in different rotative positions with its axis substantially horizontal,

(b) a float member comprising buoyant material, said member being held captive in said housing and being movable therein between raised and lowered positions,

(c) an asymmetric, elongate movable contact member disposed in the housing with its axis substantially horizontal,

(d) said movable contact member having a laterally offset portion constituting a gravity-responsive mass disposed at one side of its axis,

(e) electrically conductive bearing means in said housing, engaged with the contact member at a point intermediate its ends, and mounting the member for both turning movement and pivotal movement in the housing, and for conducting current to or from the contact member,

(f) said float member and movable contact member having cooperating engaged portions causing the movable contact member to pivot in response to rise or fall of the float member, said movable contact member being freely turnable with respect to the float member, and

(g) a fixed contact member having contact portions disposed in a generally circular configuration, said fixed contact member being located in said housing, adjacent to said movable contact member and adapted for engagement by the movable contact member in response to the pivotal movement thereof irrespective of the angular orientation of the float housing,

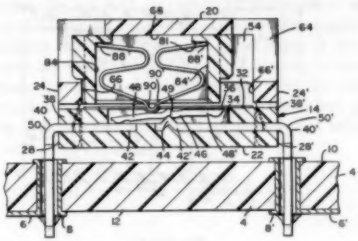
(h) said engagement of said contact members establishing a circuit from the fixed contact member to said bearing means.

4,694,129

CIRCUIT BOARD SWITCH HAVING IMPROVED SWITCH SPRING

Billy E. Olsson, New Cumberland, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 23, 1986, Ser. No. 868,367
Int. Cl.[4] H01H *5/20*
U.S. Cl. 200—68.2 **10 Claims**



1. A switch which is intended for mounting on a circuit board or the like, the switch comprising a housing assembly having a mounting face, a top face which is directed oppositely with respect to the mounting face, oppositely facing first and second housing sidewalls and oppositely facing housing endwalls, first and second fixed switch conductors which extend through the switch housing sidewalls and which have contact ends which are proximate to each other in the housing assembly, a contact bar in the housing assembly which is in overlapping relationship to the contact ends, the second fixed conductor having a fulcrum on its contact end on which the contact bar is rockably supported, a slide housing which is between the first and second housing assembly sidewalls and which is movable between a first position, in which the slide housing is proximate to the first housing sidewall, and a second position, in which the slide housing is proximate to the second housing sidewall, a spring-receiving recess in the slide housing and a spring means in the recess, the spring means being in resilient engagement with the contact bar and being effective to hold the first end of the contact bar against the first fixed contact when the slide housing is in the first position and being effective to hold the contact bar disengaged from the first fixed

contact when it is in the second position, the switch being characterized in that:

the spring means comprises first and second bellows springs, each bellows spring having a fixed end, a free end, and at least two compressible bellows spring sections between its fixed end and its free end, the spring-receiving recess having a central axis which extends normally of the housing assembly sidewalls, the free ends of the bellows springs being substantially on the central axis and being connected to each other at a bearing portion which is proximate to the mounting face, the fixed ends being spaced from the central axis and being against opposed wall portions of the recess on opposite sides of the central axis, the fixed ends being proximate to the top face,

the spring means being compressed in the direction parallel to the central axis so that the bearing portion bears resiliently against the contact bar,

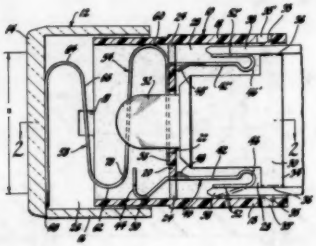
the spring means being compressed in the direction normal to the central axis so that the fixed ends of the bellows springs bear resiliently against the opposed wall portions of the recess, such that the cooperation of the fixed ends with the wall portions ensures that the spring means will be centered in the recess and resiliently maintained in that position.

4,694,130

ILLUMINATED PUSHBUTTON SWITCH WITH UNITARY SPRING AND CONTACT

Ronald A. Kitzmann, and Sarkis K. Tchejeyan, both of Santa Barbara, Calif., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 29, 1986, Ser. No. 901,944
Int. Cl.[4] H01H *1/18, 1/36, 9/16*
U.S. Cl. 200—314 **6 Claims**



1. An illuminated pushbutton switch comprising

a base,

a pushbutton mounted for telescoping movement relative to the base between released and depressed states for switch operation,

a cap on the pushbutton spaced from the base,

a lamp on the base for illuminating the cap,

a stationary contact secured to the base and extending toward the pushbutton cap, and

a unitary movable contact and bifurcated spring means secured at one end to the base and having a pair of spaced sinuous portions each portion comprising a plurality of straight sections joined at bends and compressed between the base and the pushbutton cap and engaging the cap at the cap margins to spring load the pushbutton away from the base and to allow illumination of the caps within the margins,

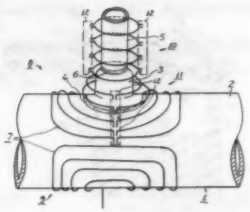
the movable contact and bifurcated spring means having an integral part adjacent and spaced from the stationary contact in one state and moving in response to pushbutton movement so that it is pressed into engagement with the stationary contact in the other state.

4,694,131

INDUCTION HEATING METHOD AND APPARATUS FOR RELIEVING RESIDUAL STRESS IN WELDED JOINT BETWEEN MAIN AND BRANCH PIPES

Toshio Ino; Tsukasa Maenosono; Kazuo Yoshida; Masanori Terasaki; Tetsusho Kuriwaki, all of Yokohama; Tadao Koga, Kisarazu, and Miharu Hirado, Yokohama, all of Japan, assignors to Daiichi Kosiuha Kogyo Kabushiki Kaisha and Ishikawajima-Harima Jukogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed May 29, 1985, Ser. No. 738,968
Claims priority, application Japan, May 31, 1984, 59-109600
Int. Cl.[4] H05B *6/40*
U.S. Cl. 219—10.41 **1 Claim**



1. A heating method for relieving residual stress in a welded joint between main and branch pipes of the type in which a portion of said main and branch pipes including the welded joint between said main and branch pipes is surrounded with a high-frequency induction coil and said coil is energized to heat said portion, thereby relieving residual stress in said welded joint, which comprises the steps of dividing said high-frequency induction heating coil axially of said main pipe to form upper and lower coil sections and also axially of said branch pipe to form first and second sections, mounting each of said coil sections on a corresponding portion of said main and branch pipes to cover the entire circumferential surface area of both of said main and said branch pipes adjacent to said welded joint so as to mate with the whole circumferential surface area of said main and branch pipes to be heated including the welded joint therebetween and disposing all of said coil sections on said main and branch pipes so that electric current flowing through said coil sections will flow in the same direction through all of said coil sections, connecting said coil sections together and causing current to flow through all of said coil sections, and establishing a substantially uniform magnetic flux density distribution over said whole circumferential surface area of said main and branch pipes including the welded joint therebetween whereby said whole circumferential surface area of said main and branch pipes including said welded joint therebetween is substantially uniformly heated to a desired temperature.

4,694,132

MICROWAVE OVEN TURNTABLE WITH REMOVABLE TABLE TOP

Yiu C. Liu, 973 Shulman Ave., Santa Clara, Calif. 95050

Filed Oct. 22, 1986, Ser. No. 921,962
Int. Cl.[4] H05B *6/78*
U.S. Cl. 219—10.55 F **14 Claims**

1. A portable microwave oven turntable comprising,

a base having a horizontal bottom and uprightly extending sides to form a base interior,

a coil spring disposed within said base interior,

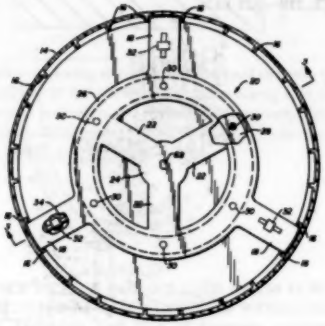
a central drive shaft rotatably attached to said base to form a vertical axis of rotation, said coil spring disposed to turn said drive shaft,

means for governing the rotational speed of said central drive shaft,

a circular base cover member connected to said base, said

base cover member having an inner circumference defining a center aperture, said central drive shaft having an upper portion projecting through said center aperture,

a spider drive member concentrically positioned atop said base cover member, said spider drive member mounted to said upper portion of the central drive shaft, said spider drive member having a plurality of radial spider arms, said spider arms having coplanar upper surfaces, and



a circular table top removably rested atop said spider drive member, said table top having a substantially planar platform and a downwardly extending cylindrical side wall and having a plurality of projecting members, each projecting member extending downwardly from a surface of said planar platform adjoining said spider drive member, a plurality of said projecting members in rotational transfer engagement with said spider arms.

4,694,133

PROCESS AND DEVICE FOR HOMOGENEOUS MICROWAVE THERMAL TREATMENT OF LIQUID OR SOLUTION IN MOTION

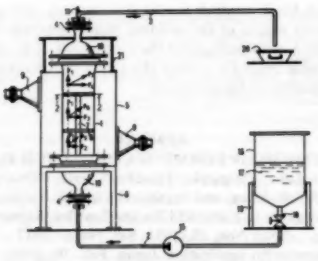
Toai Le Viet, Vevey, Switzerland, assignor to Nestec S. A., Vevey, Switzerland

Filed Mar. 31, 1986, Ser. No. 846,291

Claims priority, application Switzerland, May 6, 1985, 1906/85

Int. Cl.[4] H05B *6/78*

U.S. Cl. 219—10.55 M **9 Claims**



1. A process for heating liquids comprising:

delivering a liquid to an inlet end of a vertical cylindrical tube;

moving the liquid through the tube through at least one perforated plate in the tube and restricting the flow of the liquid in the central portion of the tube for at least a portion of a height of the tube from the inlet end;

exposing the liquid moving through the tube to a microwave energy field; and

receiving the heated liquid from an outlet end of the tube.

4,694,134

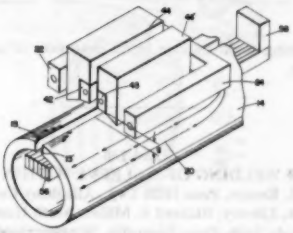
APPARATUS FOR OVERHEATING EDGES OF SKELP FOR THE PRODUCTION OF COMPRESSION WELDED PIPE

Nicholas V. Ross, Youngstown, Ohio, assignor to Ajax Magnethermic Corporation, Warren, Ohio

Filed May 28, 1985, Ser. No. 738,361

Int. Cl.[4] H05B *6/40*

U.S. Cl. 219—10.79 **4 Claims**



1. Induction heating apparatus for the overheating of the edges of preheated skelp which has been formed into a circular open shape, said apparatus comprising an induction heating coil assembly having a pair of electrically series-connected loops, each loop having a main conductor and a return conductor co-planar therewith, said main conductors being positioned within magnetic flux guides disposed over the outermost and uppermost sides of each of the said main conductors, which main conductors are each adapted to be positioned in spaced proximity to a different linear edge of the preheated open skelp to concentrate the currents along the said edges of the skelp and to provide uniform equal localized heating to welding temperature of both said preheated edges to weld the same, the return conductors positioned externally to the flux guides providing a distribution of return currents over a relatively greater area.

4,694,135

METHOD AND APPARATUS FOR MONITORING AND CONTROLLING RESISTANCE SPOT WELDING

Gregory L. Nagel; David M. Sidlosky, both of Royal Oak; Balarama V. Murty, Sterling Heights; Anthony Lee, West Bloomfield, all of Mich., and Dixon Cleveland, Vienna, Va., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 9, 1986, Ser. No. 883,934

Int. Cl.[4] B23K *11/24*

U.S. Cl. 219—110 **18 Claims**

MICROFICHE APPENDIX INCLUDED

(1 Microfiche, 59 Pages)

9. A method of controlling resistance spot welding comprising the steps of;

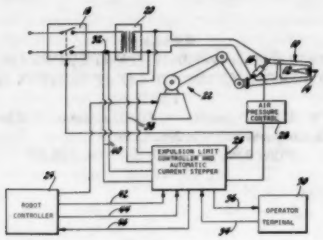
applying weld current to a workpiece,

stabilizing the weld process by applying a preheat current pulse to the workpiece immediately after initial contact of electrodes with the workpiece and then inhibiting weld current for a cooling period to establish consistent interface resistance levels,

measuring electrical welding parameters,

calculating first and second derivative resistance values from the measured parameters,

analyzing the calculated values during the welding process to detect an expulsion event and the time of the event, and



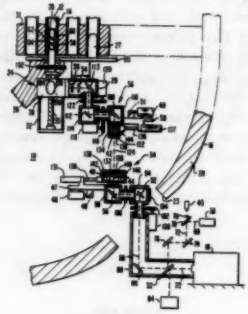
terminating weld current upon detection of an expulsion event.

4,694,136

LASER WELDING OF A SLEEVE WITHIN A TUBE

William H. Kasner, Penn Hills Twp., Allegheny County; Gerald J. Bruck, Library; Richard A. Miller, North Huntingdon, and Vincent A. Toth, Penn Township, Westmoreland County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 23, 1986, Ser. No. 821,675
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LD **24 Claims**



1. A method for welding a sleeve within a tube of a steam generator, the steam generator having a plurality of tubes supported by a tubesheet, the sleeve being in close contact with the tube at the predetermined weld site, the method comprising:

positioning a welding head having a focusing lens means, a welding mirror means, and a focal distance maintaining means within the tube at the predetermined weld site;

directing a laser beam to the welding head;

focusing the laser beam with the focusing lens means within the welding head;

reflecting the laser beam focused by the focusing lens means with the welding mirror means out of the weld head and into contact with a portion of the sleeve at the predetermined weld site;

maintaining a predetermined focal distance between the welding mirror means and the inside surface of the sleeve with the focal distance maintaining means; and

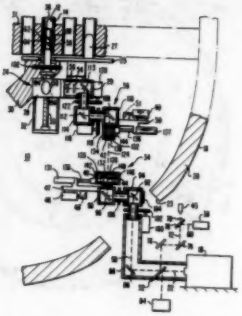
rotating the welding head at a predetermined speed to complete a weld fusion path about the inner periphery of the sleeve along which path the sleeve is fused to the tube.

4,694,137

LASER WELDING HEAD FOR SLEEVE-TO-TUBE WELDING

Phillip J. Hawkins; William H. Kasner, both of Penn Hills Township, Allegheny County, and Richard A. Miller, North Huntingdon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 23, 1986, Ser. No. 821,674
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LC **24 Claims**



1. A laser welding head apparatus for welding a sleeve within a tube by fusing the interface therebetween with a laser beam, said apparatus comprising:

cylindrical housing means adapted to be inserted axialy into the sleeve and having an opening in one end thereof, discharge outlet means in a side thereof, and a hollow portion extending axially from the opening in communication with the discharge outlet means;

focusing lens means mounted within the hollow portion of said housing means between the opening and the discharge outlet means for focusing a laser beam directed through the hollow portion;

welding mirror means mounted within the hollow portion of said housing means proximate the discharge outlet means for reflecting a laser beam focused by said focusing lens means within said cylindrical housing means through the discharge outlet means and into contact with the sleeve for fusion of the sleeve to the tube;

focal distance maintaining means for maintaining said welding mirror means a predetermined distance from the inside surface of the sleeve; and

welding head rotating means for rotating said cylindrical housing means of the welding head apparatus to circumscribe a weld path about the inside wall of he sleeve with the laser beam for joining the sleeve to the tube by fusing the interface therebetween.

4,694,138

METHOD OF FORMING CONDUCTOR PATH

Hirosi Oodaira, Chigasaki; Haruko Suzuki; Masayuki Saito, both of Yokohama, and Masayuki Ohuchi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

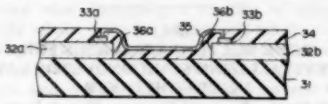
Filed Nov. 30, 1984, Ser. No. 677,017
Claims priority, application Japan, Feb. 10, 1984, 59-23088
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LM **13 Claims**

1. A method of forming a conductor circuit, comprising the steps of:

providing an insulating substrate having a surface region which is formed of an electrically insulating composition comprising an organic polymeric material and at least one metal source selected from the group consisting of elemental metallic powder and an organic compound containing chemically combined metal or metals, said insulat-

ing substrate having first and second electrical parts thereon which are spaced from each other; and

selectively heating said surface region between said first and second electrical parts along a predetermined pattern,



thereby decomposing and evaporating said organic polymeric material in the heated area and welding said metal of said metal source in the heated portion such that the metal forms a continuous conductive path which connects said first and second electrical parts.

4,694,139

GUIDANCE DEVICE FOR A LASER BEAM FOR THREE-DIMENSIONAL MACHINING OF WORKPIECES

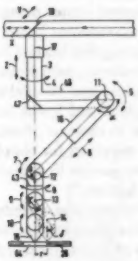
Walter Röder, Frankfurt, Fed. Rep. of Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 27, 1985, Ser. No. 802,762

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1984, 3444045; Feb. 1, 1985, 3503401

Int. Cl.[4] B23K *26/08*

U.S. Cl. 219—121 LU **33 Claims**



1. Guidance device for a laser beam repeatedly reflected at 45° mirrors for three-dimensional machining of workpieces, with five controlled axes of motion, of which a first and second axes of motion are the horizontal coordinate axes X and Y, a third and fourth axes of motion are realized coaxially in a rotatable telescopic installation which is variable in length and the fourth axis of motion is a horizontal swiveling axis, around which the laser head can be swiveled, whereby beginning with the third axis of motion a self-supporting design is provided, wherein the improvement comprises that an additional axis of motion **(5)** designed as a horizontal swiveling axis **(11)** is provided parallel to the laser head swiveling axis **(14)**, the distance from the additional horizontal swiveling axis **(11)** to the laser head swiveling axis is larger than the length of the laser head **(15)**, whereby the laser beam reflection at the additional swiveling axis **(11)** is provided in such a way that the central axes of the telescopic installation **(3)** and the laser head **(15)** are always located in a common vertical plane, and that the swiveling angles (α, β) at the additional swiveling axis **(11)** and the laser head swiveling axis **(14)** are adapted to each other in a programmable- and adjustable manner according to the position of the workpiece surface to be machined.

4,694,140

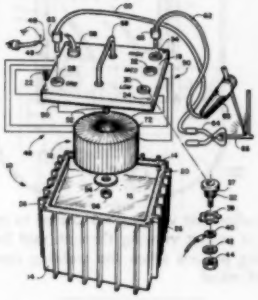
AC POWER SUPPLY

William M. Wheeler, 5938 Eton Ct., San Diego, Calif. 92122; David C. Wheeler, 7860 Dancy Rd., San Diego, Calif. 92126, and Ernest E. Wheeler, 5938 Dton Ct., San Diego, Calif. 92122

Filed Nov. 14, 1985, Ser. No. 798,123

Int. Cl.[4] B23K *9/10*

U.S. Cl. 219—130.1 **24 Claims**



1. An improved portable AC welding machine comprising:

a liquid tight tank with a removable lid thereon;

a power transformer positioned within said tank, said power transformer comprising, a cylinderical core with an open tubular center, perforated insulation material enclosing said core, a primary electricaly winding wound over said perforated insulation material, a wrapping of porous insulation material over said primary winding and a secondary winding wound over said porous insulation material, the ends of said primary and secondary windings extend external of said tank;

an insulating medium within said tank engulfing said power transformer, said insulating medium is liquid at least when said power transformer is at operating temperature;

a pair of welding cables extending from said ends of said secondary windings; and

a power source for connecting to said ends of said primary winding.

4,694,141

AUTOMATIC WELDER'S HELMET

Lawrence R. Hahn, Pickens, S.C., assignor to The Fourth Dimension, Inc., Pickens, S.C.

Filed Oct. 31, 1986, Ser. No. 925,156

Int. Cl.[4] A23K *9/32;* **A61F** *9/06*

U.S. Cl. 219—147 **15 Claims**

1. A welding helmet for use with an electric arc welding system, comprising:

(a) an open back head shield;

(b) a head harness connected to said head shield for supporting the same on the head of an operator;

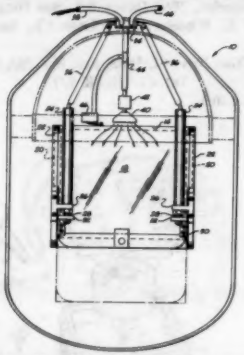
(c) a fixed clear eye lens secured in an opening in said head shield;

(d) a movable dark eye lens mounted in a frame which is slidably secured about said opening in said head shield, said dark eye lens being operable to slide over said opening between opened and closed positions;

(e) two pneumatic cylinders, each having a spring loaded piston and a piston rod, one of which is disposed on said head shield adjacent to each end of said dark eye lens frame, each piston rod being connected to said dark eye lens frame, the springs in said pistons urging said dark eye lens into the closed position; and

(f) control means operatively associable with said welding system and said helmet for operating said welding system

and said cylinders for depressurizing said cylinders and permitting said dark eye lens to close before the welding operation begins and for automatically pressurizing said



cylinders after said welding has ceased to open said dark eye lens to permit viewing through said fixed clear eye lens during periods when the welding operation is not being performed.

4,694,142

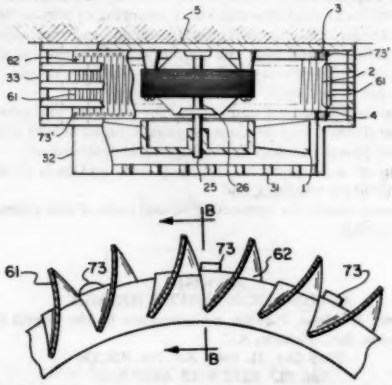
ELECTRIC AIR HEATER

Dov Z. Glucksman, 1578 Beacon St., Brookline, Mass. 02146

Filed Nov. 29, 1984, Ser. No. 676,277

Int. Cl.[4] F24H *7/00*

U.S. Cl. 219—371 **14 Claims**



1. An electric forced-convection air-heater consisting of an axial fan in the form of an electric motor and an axial fan impeller mounted on the shaft of said motor, an electric resistance heater in the shape of a cage mounted on a common base with said fan, upstream of said fan impeller in coaxial alignment therewith in a manner permitting air to be drawn by said fan impeller through said cage and to be heated by said resistance heater, the inclination of the vanes of said fan serves to create an initial vortex to the air before its entry into the impeller, and means for electrically energizing said motor and said resistance heater,

wherein said cage-shaped resistance heater consists of a plurality of spaced longitudinal strips of an electric resistance alloy, of substantially uniform width extending substantially parallel to the axis of said fan, the surface of each strip forming an angle with a tangent to the periphery of said cage, said strips being held in a predetermined angle of inclination by conductive bridging portions of the same material but of a larger cross section than said strips, said bridging portions jointing the alternate ends of each of two proximate strips so as to form a resistor circuit in a zig zag pattern, said cage being held in shape and position by two supporting frames of a heat-resistant and non-conductive material, one frame each being firmly connected to all bridging portions at one end of said cage, and holding said bridging portion in spaced-apart electrically insulating alignment.

4,694,143

ZONE MELTING APPARATUS FOR MONOCRYSTALLIZING SEMICONDUCTOR LAYER ON INSULATOR LAYER

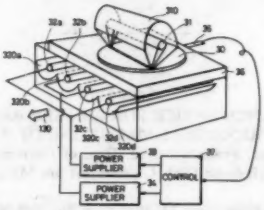
Tadashi Nishimura; Kazuyuki Sugahara; Shigeru Kusunoki, and Yasuo Inoue, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1985, Ser. No. 815,069

Claims priority, application Japan, Feb. 26, 1985, 60-39590

Int. Cl.[4] H05B *3/64*; F27D *11/00*; F27B *5/14*

U.S. Cl. 219—388 **15 Claims**



1. A zone melting apparatus for monocrystallizing a semiconductor layer deposited on an insulator layer, comprising:

a support plate for supporting a layered substance including said semiconductor layer and said insulator layer;

an upper elongated heated for zone melting of said semiconductor layer, said upper heater being disposed above and parallel to said semiconductor layer;

a plurality of lower elongated heaters for heating the whole of said layered substance, said lower heaters being disposed in a plane below and parallel to said support plate and the axis of each of said lower heaters being substantially perpendicular to the axis of said upper heater;

a plurality of power suppliers for supplying predetermined amounts of electric power to individual heaters in said plurality of lower heaters;

a temperature sensor disposed at a predetermined position in said support plate for generating an output corresponding to the temperature of said layered substance thereat;

a controller for controlling said power suppliers in response to the output of said temperature sensor, said controller being capable of controlling said power suppliers to supply large amounts of electric power to those of said lower heaters located more remotely from the central portion to said layered substance than to those local heaters located closer to said central portion, whereby the temperature in said central portion of said layered substance is controlled to be lower than that in the outer edge portions of said layered substance; and

means for moving said upper heater relative to said layered substance in the axial direction of said lower heaters.

4,694,144

DOUBLE-GLAZED FRAME HAVING AN INTERNAL TUBULAR BLIND

Pierre Delaroche, 3, rue Granvelle, 25000 Besancon, and Paul Depondt, 3, rue des Chênes Pourpres, 95000 Cergy, both of France

Filed Jul. 17, 1985, Ser. No. 755,729

Int. Cl.[4] E06B *9/24*; H05B *3/06*

U.S. Cl. 219—522 **10 Claims**

1. A double-glazed window frame for erection between an outside environment and an inside environment comprising a first glass pane adjacent said outside environment, a second

glass pane adjacent said inside environment, and an internal blind, wherein

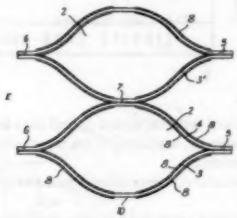
said first glass pane and said second glass pane are parallel to one another and spaced apart by a predetermined width;

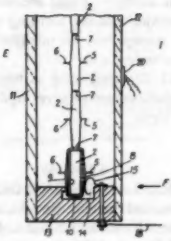
said internal blind is disposed parallel to and intermediate said first glass pane and said second glass pane;

said internal blind comprising a plurality of collapsible, elongated tubular volumes, each of said tubular volumes extending in a longitudinal direction, said tubular volumes being disposed in at least one row extending in a vertical direction, said vertical direction being transverse to said longitudinal direction, said blind being raisable and lowerable in said vertical direction;

each of said tubular volumes being bounded by longitudinally extending strips of plastic, each of said strips of plastic having a pair of opposed edges, one edge adjacent said first glass pane and the other edge adjacent said second glass pane, an upper face and a lower face;

said upper face and said lower face of each of said strips of





plastic each having a metallic layer disposed thereon, each of said metalic layers having a longitudinally extending discontinuity disposed between said pair of opposed edges.

10. A method of manufacture of an internal blind forming part of a double-glazed window frame as claimed in any one of claims **1**, **2**, **3**, **4**, **5**, **6**, **7**, **8** or **9**, comprising

provided a sheet of plastic, having an upper face and a lower face, which has been coated by a metallic layer on each of said faces;

cutting strips of plastic from said sheet, said strips having a predetermined width and a predetermined length;

removing the metallic layer on each of said faces of each strip of plastic cut from said sheet in at least two predetermined zones of adhesion which extend lengthwise of said sheet;

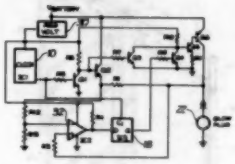
joining said strips of plastic by aligning said at least two predetermined zones of adhesion with one another for each strip and then gluing adjacent sheets together along at least one of said aligned zones of adhesion.

4,694,145

ELECTRONIC CONTROLLER FOR PREDETERMINED TEMPERATURE COEFFICIENT HEATER

Douglas J. Romstadt, Oregon, Ohio, and William R. Seitz, Birmingham, Mich., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 15, 1985, Ser. No. 701,907
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—497 **2 Claims**



1. In a diesel engine a system for controlling positive temperature coefficient glow plugs comprising:

at least one positive temperature coefficient glow plug in each cylinder of a diesel engine;

clock means for generating clock signals having a sample period and an activation period;

contactless means for applying activating current to each of said glow plugs;

means for sensing an amount of sensing current to only one of said glow plugs during said sample period of said clock means and generating a first electrical signal proportional to the amount of sensed current, said sensing current being less than said activating current and said sensing means not responsive to said activating current to said glow plugs;

means for generating a second electrical signal proportional to the actual temperature of the diesel engine;

means for generating a third electrical signal representing a predetermined glow plug temperature;

means for generating a fourth electrical signal representing a predetermined operating temperature of said engine;

means responsive to said first and third electrical signals during said activation period of said clock means for activating said contactless means for applying activating current to each of said glow plugs when said actual temperature is less than said predetermined operating temperature; and

means responsive to said second and fourth electrical signals for inhibiting said contactless means for applying activating current to each of said glow plugs when said temperature of said engine is equal to said predetermined operating temperature.

4,694,146

BRACKET MOUNTED TOWEL DRYING CABINET

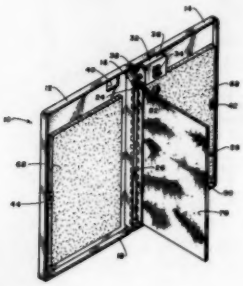
Robert A. DeMars, 7932 Maestro Ave., Canoga Park, Calif. 91304

Filed Oct. 28, 1985, Ser. No. 791,735
Int. Cl.[4] H05B *3/30*
U.S. Cl. 219—524 **5 Claims**

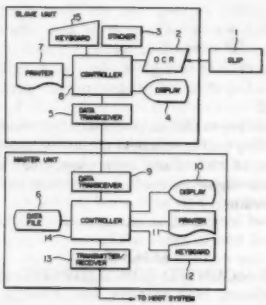
5. A bracket mounted cabinet for warming cloth material comprising:

(a) a housing comprising two opposed covers, hingedly attached by a first hinge means along one side and defining an enclosed space upon closure thereof;

(b) support and heating means for supporting and heating a towel within said enclosed space, said support means hingedly attached by a second hinge means intermediate said covers, said support and heating means comprising:
(1) an inner rigid metal plate, and
(2) a resistance heating element on at least one side of said plate;
(c) means for providing power to said heating means, comprising a switch for activation of said heating means and a thermostat for sensing a temperature and for switching said heating means on and off as required; and
(d) means for mounting said cabinet on a bracket, comprising a pair of brackets adapted to fit over a towel rack, said pair of brackets mounted near a top portion of said cabinet, and a spacer bracket mounted near a bottom portion of said cabinet below said pair of brackets and adapted to maintain said cabinet in a substantially upright position.

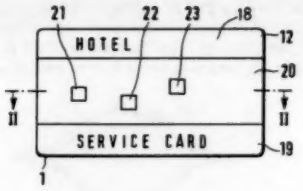


4,694,147
SLIP RECEPTION TERMINAL SYSTEM
Tsuguo Amemiya, Yokohama; Yutaka Magata, Tokyo; Satoshi Fujimatsu, and Masahiro Morita, both of Owariasahi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 6, 1986, Ser. No. 826,676
Claims priority, application Japan, Mar. 20, 1985, 60-57024
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—379 **1 Claim**



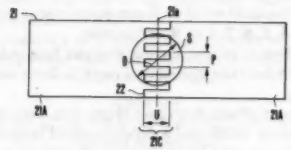
1. A slip reception terminal system comprising:
a slave unit installed on the customer's side for reading an image written on a slip by a customer and recognizing a predetermined item of said slip; and
a master unit installed on the teller's side for receiving image data and recognized data sent from said slave unit, stacking said data temporarily, displaying said data sequentially, and transmitting a predetermined part of said data to a host system after the teller has verified and corrected the displayed data.

4,694,148
ACCESS CARD
Erwin Diekemper, and Dieter Kastrup, both of Gutersloh, Fed. Rep. of Germany, assignors to MIDS Magnetische Informations-und Daten-Systeme GmbH, Fed. Rep. of Germany
Filed Jul. 5, 1985, Ser. No. 751,946
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1985, 3504109; European Pat. Off., Mar. 20, 1985, 85103216.9
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—468 **11 Claims**



1. An access card with recorded coded data including markings which appear on a radiation receiver when exposed to radiation, comprising:
a first and a second continuous and transparent plastic foil or film blank;
a layer of material arranged between said blanks, said material being non-transparent for visible light and transparent for infrared light and disposed on at least a portion of one surface of said first blank;
a layer of photosensitive material (7) carried on at least a portion of one surface of said second blank;
said first and second blanks forming a laminate with said layer that is transparent to infrared light covering said photosensitive layer; and
the markings (21–23) appearing as negative or positive images on said photosensitive layer upon existing said blanks to a marking light.

4,694,149
FOCUS ADJUSTING DEVICE
Masamichi Toyama, and Susumu Kozuki, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Japan
Filed Dec. 5, 1985, Ser. No. 805,986
Claims priority, application Japan, Dec. 7, 1984, 59-257496; Dec. 7, 1984, 59-257497; Dec. 7, 1984, 59-257498
Int. Cl.[4] G01J *1/20;* **G01C** *3/08;* **G03B** *3/00*
U.S. Cl. 250—201 **9 Claims**



1. A distance measuring device comprising:
(a) light projecting means for projecting distance measuring light toward an object, said distance measuring light being reflected by the object and becoming reflected light;
(b) sensing means for receiving said reflected light and producing signals relating to a distance to said object, said sensing means having a plurality of sensing zones, wherein

a boundary line, forming boundaries between one sensing zone and another sensing zone, forms projections and indentations; and

(c) computing means for computing a distance to said object based on said signals.

4,694,150

METHOD AND APPARATUS FOR ACOUSTIC SUPERVISION OF ADJUSTMENT OPERATIONS AT OPTICAL DEVICES

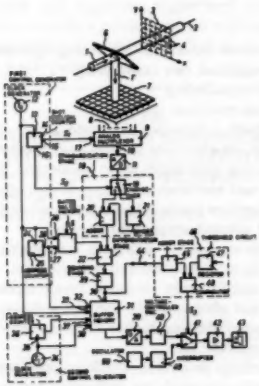
Joerg Schulz-Hennig, Heikendorf, and Horst Sievers, Preetz, both of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Jun. 11, 1985, Ser. No. 743,516

Claims priority, application European Pat. Off., Jun. 18, 1984, 84 106945.3

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—201 17 Claims



1. A method for acoustic supervision of adjustment of a light bundle with respect to its intensity distribution in a reference plane which is at right angles to an optical axis of the light bundle, comprising the steps of:

subdividing the reference plane into surface area elements, and defining and storing a desired intensity value I_s for each surface area element so as to create a stored desired intensity distribution;

measuring each of the surface area elements in a first cyclical successsion actual intensity values I_i resulting at each of said surface area elements as a result of illumination by the light bundle;

calculating and storing for each of the surface area elements associated intensity deviations between said desired intensity values I_s and actual intensity values I_i;

successively reading out in a second cyclical succession the intensity deviations;

generating an oscillation signal and modulating at least one parameter of the oscillation signal to create a modulated oscillation signal dependent on the associated intensity deviations; and

converting the modulated oscillation signal into modulated audible measuring tones, said modulated audible measuring tones representing for the surface area elements a deviation of the intensity distribution from the desired intensity distribution.

4,694,151

AUTOFOCUSING ZOOM LENS SYSTEM WITH BEAM SPLITTER PRISM FOR SINGLE LENS REFLEX CAMERAS

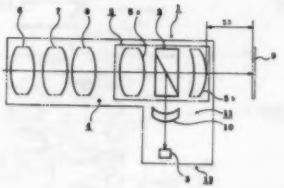
Hirofumi Yoshimura, Nakano, Japan, assignor to Kabushiki Kaisha Cosina, Nakano, Japan

Filed Jun. 17, 1985, Ser. No. 745,777

Claims priority, application Japan, Jul. 6, 1984, 59-102686[U]

Int. Cl.[4] G03B *3/10*

U.S. Cl. 250—201 5 Claims



1. In an autofocusing zoom lens system for a single lens reflex camera having a beam splitter prism and comprising a focusing lens group adapted to be driven back and forth freely, a variator lens group for zooming located behind said focusing lens group, a compensator lens group located behind said variator lens group, a master lens group fixed behind said compensator lens group, said master lens group allowing the optical image of an object to form on a film in the body of the camera, a beam splitter prism, and a sensor positioned to detect image displacement formed by a beam reflected at said beam splitter prism for driving said focusing lens group to recover image displacement for autofocusing, the improvement wherein said master lens group includes a fixed front lens group and a fixed rear lens group, and said beam splitter prism is inserted between said fixed front lens group and said fixed rear lens group.

4,694,152

METHOD AND APPARATUS FOR ACOUSTIC SUPERVISION OF ADJUSTMENT OPERATIONS AT OPTICAL DEVICES

Joerg Schulz-Hennig, Heikendorf, and Horst Sievers, Preetz, both of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Jun. 11, 1985, Ser. No. 743,514

Claims priority, application European Pat. Off., Jun. 18, 1984, 84106943.8

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—201 11 Claims

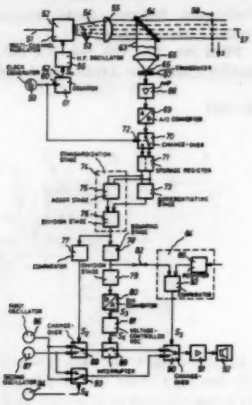
1. A method for symmetrically adjusting an intensity distribution formed by rays of a light bundle along a given direction line lying in a reference plane which lies transverse to an optical axis of the light bundle, comprising the steps of:

measuring intensity values of first and second rays of said intensity distribution symmetrically spaced from and on opposite sides of said optical axis;

calculating a differential intensity value from said first and second rays, an amount of said differential intensity value being indicative of an amount of deviation from a desired symmetry for said intensity distribution, and a sign of said differential intensity value being indicative of a direction away from said desired symmetry of the intensity distribution; and

providing an audible oscillation, and changing a first param-

eter of said audible oscillation based on said differential intensity value amount and changing a second parameter



of said audible oscillation based on said intensity value sign.

4,694,153

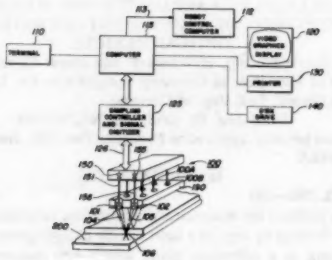
LINEAR ARRAY OPTICAL EDGE SENSOR

Antal K. Bejczy, Pasadena, and Howard C. Primus, La Crescenta, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Oct. 29, 1985, Ser. No. 792,450

Int. Cl.[4] G05B *1/00*

U.S. Cl. 250—202 **11 Claims**



1. An optical sensing system comprising:

a plurality of pairs of, side-sy-side light omitting and detecting diodes with each pair forming one element of a linear pixel array, which array is located laterally on one side of and at a predetermined distance from a surface discontinuity of an opaque workpiece to be sensed; and

means optically sequencing each pixel in said array for developing from transmitted and reflected light. discrete signal points defining a signal trace having upper and lower portions which bracket a transistor portion indicative of said discontinuity.

4,694,154

INSTRUMENTS FOR MEASURING LIGHT PULSES CLOCKED AT HIGH REPETITION RATE AND ELECTRON TUBE DEVICES THEREFOR

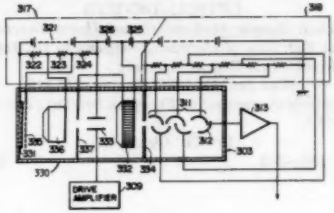
Yutaka Tsuchiya; Musubu Koishi, and Akira Takeshima, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Hamamatsu, Japan

Division of Ser. No. 557,252, Dec. 1, 1983, Pat. No. 4,645,918. This application May 29, 1986, Ser. No. 868,110

Claims priority, application Japan, Dec. 7, 1982, 57-214143; Jan. 21, 1983, 58-9040; Jan. 21, 1983, 58-9041

Int. Cl.[4] H01J *31/50*

U.S. Cl. 250—213 VT **2 Claims**



1. An electron tube device for measuring light pulses generated at a high repetition rate comprising:

an electron tube including

an evacuated envelope; and

a photocathode, a focusing electrode, a pair of deflection electrodes, an electrode having a slit therein extending in a direction perpendicular to an electric field applied between said electrodes, a group of dynodes for multiplying electrons passing through said slit and a collector electrode aligned within said envelope;

a power supply device for supplying voltages to said focusing electrode, slit electrode and said dynodes, the voltage applied to said focusing electrode being higher than that applied to said photocathode and the voltages applied to said slit electrode being higher than that applied to said focusing electrode; and

a deflection voltage generator coupled to said pair of deflection electrodes for applying deflection voltages thereto, said deflection voltages successively changing in phase with respect to light pulses impinging on said photocathode, whereby different portions of said light pulses are successively sampled.

4,694,155

CIRCUIT ARRANGEMENT TO ASCERTAIN AND INDICATE THAT A LUMINOUS DENSITY LIMIT CONDITION IS EXCEEDED

Walter Bletz, Braunfels, and Rolf Magel, Fernwald, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Jul. 23, 1985, Ser. No. 757,881

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1984, 3427055; Jun. 22, 1985, 3447982

Int. Cl.[4] H01J *40/14*

U.S. Cl. 250—214 R **6 Claims**

1. A circuit for determining and indicating that a luminous density limit is exceeded, comprising:

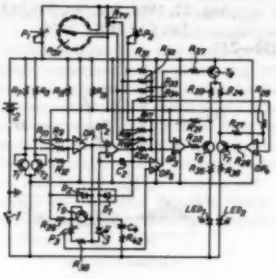
photoelectric diode means for producing a diode signal indicative of an incident luminous density;

means, arranged to receive said diode signal, for producing a logarithmic signal having an amplitude corresponding to the logarithm of the amplitude of said diode signal;

circuit means for generating a determinable limit value signal, said circuit means having an adjustable temperature dependent circuit comprising a potentiometer having a tap

and also comprising a temperature-dependent dividing circuit connected to said potentiometer; and

comparator means having a first input and a second input, said first input being connected to receive said logarithm signal and said second input being adapted to receive said



limit value signal for comparing said limit value signal and said logarithm signal and for producing a control output signal when said logarithm signal and said limit value signal fail to satisfy a predetermined relationship,

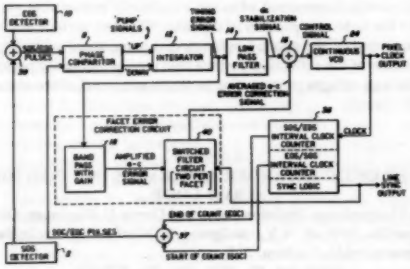
said control output signal being applied to an indicator circuit and a processing stage.

4,694,156

PIXEL PLACEMENT SENSING ARRANGEMENT USING SPLIT DETECTING ELEMENTS

Melvin E. Swanberg, Claremont, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 14, 1986, Ser. No. 797,355
Int. Cl.[4] H04N *1/04*
U.S. Cl. 250—214 RC **4 Claims**



1. A pixel placement sensing arrangement, comprising,

a split photodetector having photodetector halves producing current when exposed to a light spot,

a first RC integrating circuit connected to one half of said split photodetector and a second RC integrating circuit connected to the other half of said split photodetector, the RC time constant of each of said integrating circuit being long relative to the exposure time of said photodetector, whereby the current accumulated in the capacitors of said RC integrating circuits result in voltages that are proportional to the respective exposures of said halves of said split photodetector, and

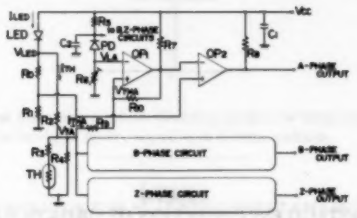
a differential amplifier receiving at its inputs the respective integrated voltages of said RC circuits such that the output of said amplifier reflects any difference between the exposure time of the different halves of the split photodetector.

4,694,157

TEMPERATURE COMPENSATED ELECTRO-OPTICAL LIGHT TRANSMISSION CIRCUIT FOR USE IN A POSITION DETECTOR

Kazuhiro Mishina, Kadoma, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

PCT No. PCT/JP84/00495, § 371 Date Jun. 19, 1985, § 102(e) Date Jun. 19, 1985, PCT Pub. No. WO86/02440, PCT Pub. Date Apr. 24, 1986
PCT Filed Oct. 18, 1984, Ser. No. 752,339
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—214 C **2 Claims**



1. A temperature compensated electro-optical light transmission circuit for use in detecting the motion of a moving object, comprising:

a light emitting diode connected in series with a first resistor across a voltage source, said light emitting diode emitting light which varies in intensity in a monotonic decreasing relationship with an increasing ambient temperature over a temperature range from a low temperature point to a high temperature point;

a photodiode connected in series with a load resistor across the voltage source and cooperating with said light emitting diode to define an optical path in which a moving object is positioned to intermittently break the light transmitted from the light emitting diode to the photodiode as said object moves for detection of the motion thereof, said photodiode having the inherent characteristic of producing an output voltage which varies in a monotonic increasing relationship with the increasing ambient temperature over the same temperature range upon receipt of light of a constant level so that said photodiode responds to receiving the light from said light emitting diode for producing an output voltage which varies in a linear relationship with the increasing ambient temperature over the same temperature range, said linear relationship reflecting the variations in the outputs of the light emitting diode and the photodiode with the varying ambient temperature;

an operational amplifier having its inverting input connected to the photodiode for receiving the output therefrom, and said operational amplifier having its non-inverting input connected through a feedback resistor to its output end so as to form a Schmitt trigger circuit;

a temperature compensating network connected across said first resistor, said temperature compensating network being in the form of a series-parallel resistor circuit comprising a series combination of a second resistor, a third resistor and a thermistor having a negative coefficient of resistivity, and a fourth resistor connected across said third resistor and said thermistor in parallel relationship therewith, the connection point between the second resistor and the third resistor being connected to the non-inverting input of the Schmitt trigger circuit so as to apply thereto the output voltage developed across the third resistor and thermistor combination as a reference voltage defining a threshold voltage for comparison with the output voltage of the photodiode indicative of the intensity of the light received; and

said temperature compensating network having values of said second, third and fourth resistors determined in con-

formity with the value of the thermistor, such that said threshold voltage varies in a linear proportional relationship with the increasing ambient temperature over the same temperature range for counterbalancing said linear relationship between the output voltage of the photodiode receiving light from the light emitting diode and the varying ambient temperature, thereby producing a correspondingly varying threshold voltage to compensate for both the variations in the outputs of the light emitting diode as well as the photodiode over said temperature range.

4,694,158

CONTACTLESS INSPECTION OF OBJECTS WITH FEEDBACK TO HIGH SPEED MANUFACTURING DEVICE

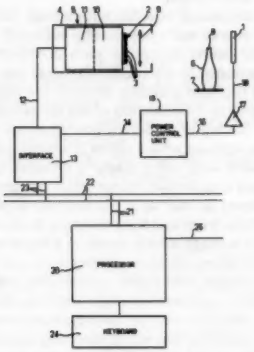
Jacques Leser, Lunel, France, assignor to Verrerie du Languedoc et Cie, Vergeze, France

Filed Oct. 1, 1985, Ser. No. 782,336

Claims priority, application France, Oct. 2, 1984, 84 15117

Int. Cl.[4] B07C *5/00, 5/02, 5/342*

U.S. Cl. 250—223 B **13 Claims**



1. A method of continuous contactless inspection of glassware articles and automatic control of the manufacturing process of said glassware articles comprising the following steps:

moving said glassware articles before substantive cooling and before any subsequent annealing step between an optical sensor means and a light source,

said optical sensor means comprising a linear measuring strip of a plurality of receptor photodiodes and means for thermal protection of said sensor means, said strip having its longitudinal axis perpendicular to the movement of said articles,

using said light source to illuminate one side of the entire surface of one said glassware articles while regulating said light source to avoid any flickering,

storing data issued by said sensor means for a given number of glassware articles,

and periodically controlling the manufacturing process in accordance with the stored data.

4,694,159

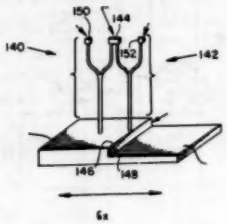
OPTIC SENSOR WITH REFERENCE AND DETECTING OPTIC CIRCUITS

Larry E. Parkhurst, Boulder, and Michael R. Meadows, Nederland, both of Colo., assignors to Dieterich Standard Corporation, Boulder, Colo.

Continuation of Ser. No. 617,889, Jun. 6, 1984. This application Aug. 22, 1986, Ser. No. 899,013

Int. Cl.[4] H01J *5/16*

U.S. Cl. 250—227 **1 Claim**



6a

1. An optic displacement sensor comprising a light reflecting means; first and second optic circuits; and first and second optic circuits comprising bi-directional means for a light supply path to and a light return path from the said light reflecting means; wherein the first optic circuit is a reference signal circuit and the second optic circuit is a measuring signal circuit; means for directing light into the light supply paths of the said first and second optic circuits from a single light source; mounting means such that light from the light supply paths of the first and second optic circuits is received by the reflecting means and at least partially reflected into the light return paths of said first and second optic circuits; detector means for each light return path of said first and second optic circuits; and means for adjusting the measuring signal with respect to the reference signal, wherein sensing ends of the first and second optic circuits are mounted adjacent to one reflective surface of the light reflecting means; wherein the sensing end of the first optic circuit is mounted adjacent a normally immovable parallel to the light axis portion of the said reflective surface and the sensing end of the second optic circuit is mounted adjacent to a portion of the reflective surface that moves primarily parallel to the axis of light propagation at the sensing end of the second optic circuit.

4,694,160

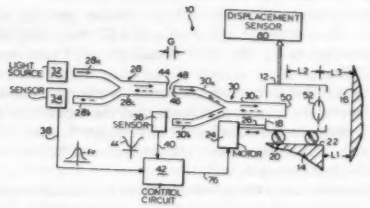
FIBER OPTIC EXTENDER APPARATUS IN A POSITION SERVO LOOP

Leo Hoogenboom, Ballston Lake, and Curtis D. Kissinger, Gloversville, both of N.Y., assignors to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jan. 29, 1986, Ser. No. 823,671

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—227 **10 Claims**



1. A proximity sensor for determining the distance between a fixed reference and a target comprising:

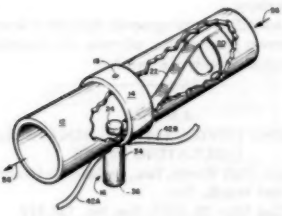
a light sensor;
first and second bifurcate bundles of optical fibers;
imaging means positioned between said first and second bifurcate bundles and said target;
first and second light detectors for generating first and second sensor signals corresponding to the light intensities detected by the detectors; said first and second bundles being positioned and arranged to direct light from said light source to said target through said imaging means and to transmit reflected light from said target to the first and second sensors respectively for generating two corresponding sensor signals, said sensor signals having a maximum and a minimum intensity respectively when one of said bundles is at a preselected distance from the target;
means for generating a control signal corresponding to the difference between said first and second detector signals;
movable means attached to said one bundle; and
means for moving said attached movable means and thus said one bundle in accordance with said control signal for tracking said target.

4,694,161

FLUID FLOW AND LEVEL DETECTOR

Robert R. Sackett, 2282 Caminito Pescado #43, San Diego, Calif. 92107

Filed Nov. 4, 1985, Ser. No. 794,528
Int. Cl.[4] G01F *1/58*
U.S. Cl. 250—231 R **27 Claims**



1. A fluid flow detection switch comprising:
a tubular housing;
a movable member positioned within said housing and influenced by fluid flow through said housing;
a permanent magnet carried by said movable member; and
a sensing means influenced by the permanent magnet for detecting the absence of fluid flow through said tubular housing, said sensing means comprises an optical shutter positionable by influence from said permanent magnet when said magnet is in close proximate therewith and a pair of fiber optic cables, one of said cables providing a source of light to one side of said shutter and the other one receiving light therefrom when said shutter is in a certain shutter position.

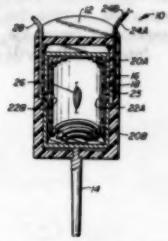
4,694,162

SIGN BIT OPTICAL-ELECTRICAL GEOPHONE

Swan A. Sie, Placentia, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 9, 1983, Ser. No. 560,017
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 R **15 Claims**

1. An optical-electrical geophone comprising:
electrical means for transmitting an electrical signal to a geophone case;
light source means connected to said means for transmitting an electrical signal in said geophone case;
light chopping means located within said case, said light chopping means containing a passage therethrough for the transmission of light from said light source means;
oscillating means connected to said chopping means, said oscillating means capable of oscillating said chopping means in response to geological movement so as to create a light/no-light binary signal; and



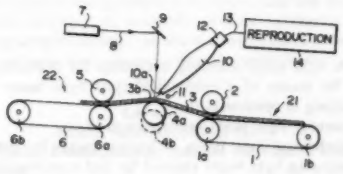
optical fiber signal return directing means for returning the light/no-light binary signal to a seismic vehicle.

4,694,163

APPARATUS FOR SCANNING SHEET-SHAPED RECORDING MEDIUM WITH A BENDING ROLLER

Makoto Ohgoda; Kaoru Tamura, and Yasuhiro Kawai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 4, 1984, Ser. No. 657,640
Claims priority, application Japan, Oct. 21, 1983, 58-197192
Int. Cl.[4] H01J *3/14*
U.S. Cl. 250—234 **6 Claims**



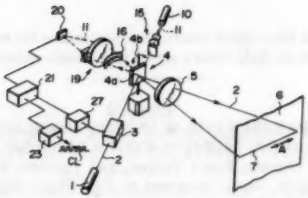
1. An apparatus for scanning a sheet-shaped recording medium, the apparatus comprising:
(i) a first conveyance means for conveying the sheet-shaped recording medium,
(ii) a second conveyance means for receiving and conveying said recording medium conveyed by said first conveyance means, said second conveyance means being positioned downstream of said first conveyance means in spaced relation thereto by a predetermined distance shorter than the length of said recording medium,
(iii) a roller, positioned between said first conveyance means and said second conveyance means, movable in a first direction approximately normal to a recording medium conveyance plane away from said recording medium for enabling said recording medium to be conveyed by said first conveyance means toward said second conveyance means, said roller further being movable in a second direction opposite said first direction for contacting said recording medium after said recording medium conveyed by said first conveyance means reaches said second conveyance means so as to bend said recording medium convex as viewed from the side thereof opposite to said roller, and
(iv) a scanning optical system positioned on the side opposite to said roller with respect to said recording medium for scanning the convex surface of said recording medium bent by said roller by a light beam in a scanning direction normal to the conveyance direction of said recording medium.

4,694,164

LIGHT BEAM SCANNING APPARATUS

Masaru Noguchi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 724,722, Apr. 18, 1985, abandoned. This application Dec. 1, 1986, Ser. No. 936,939
Claims priority, application Japan, Apr. 18, 1984, 59-78230
Int. Cl.[4] H01J 5/02
U.S. Cl. 250—234 6 Claims



1. A light beam scanning apparatus for deflecting a light beam by means of a mechanical type light beam deflector comprising in combination;

a scanning light beam generating means,

a mechanical light beam deflecting means for deflecting a scanning light beam emitted by said scanning light beam generating means,

a position detecting light beam generating means for generating a position detecting light beam and causing the position detecting light beam to impinge upon said mechanical light beam deflecting means at a position substantially coincident with the position where said scanning light beam is deflected thereby,

a converging optical system for converging the position detecting light beam deflected by said deflecting means,

a light beam position detecting means provided on the plane on which said position detecting light beam is converged for detecting the position where the position detecting light beam is converged,

a signal processing circuit which processes the output signal from said light beam position detecting means and outputs an angular position signal indicative of the angular position of said mechanical light beam deflecting means and a deviation signal indicative of the deviation of the position detecting light beam in the direction perpendicular to the deflecting direction,

a correcting light beam deflector for deflecting the scanning light beam before the scanning light beam impinges upon the scanning light beam deflector in the direction perpendicular to the scanning direction at the time of scanning, and

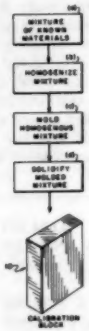
a correcting light beam deflector driving control means which receives said deviation signal and drives said correcting light beam deflector in such a manner as to correct the deviation.

4,694,165

BULK MATERIAL ANALYZER CALIBRATION BLOCK

Raymond J. Proctor, San Diego; Thomas L. Atwell, Del Mar; Clinton L. Lingren, San Diego, and James F. Miller, Solana Beach, all of Calif., assignors to Gamma-Metrics, San Diego, Calif.

Filed Sep. 30, 1985, Ser. No. 782,272
Int. Cl.[4] G01D 18/00; G01F 23/00
U.S. Cl. 250—252.1 9 Claims



1. A calibration block for use in calibrating a bulk material analyzer, comprising

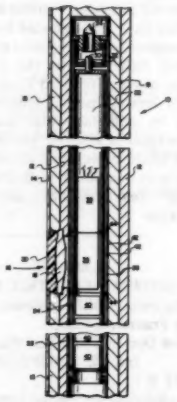
a block of a solidified homogeneous mixture of known materials in known proportions, wherein the materials do not react chemically with one another.

4,694,166

LOGGING DEVICE HAVING BIMETALLIC INSULATING FLASK

Dale A. Gearhart, Fort Worth, Tex., assignor to Gearhart Industries, Inc., Fort Worth, Tex.

Filed May 28, 1985, Ser. No. 738,419
Int. Cl.[4] G01V 5/04
U.S. Cl. 250—261 12 Claims



1. A well logging device suitable for insertion into a wellbore comprising:

a sonde suitable for insertion into a wellbore;

an insulated bimetallic storage vessel disposed within said sonde, said insulated bimetallic storage vessel comprising an inner shell including a continuous imperforate cylindri-

cal wall and a radially spaced apart outer shell including a continuous imperforate cylindrical wall, each of the said cylindrical walls being constructed of a first metallic material and having a portion thereof constructed of a low density second metallic material having high photon transmission properties; and

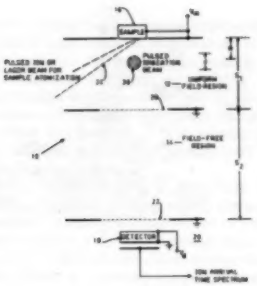
a photon detector disposed within said inner shell and surrounded by said low density second metallic material wherein photons pass through said low density second metallic material of the walls of the inner and outer shells to said photon detector.

4,694,167

DOUBLE PULSED TIME-OF-FLIGHT MASS SPECTROMETER

Marvin G. Payne; Norbert Thonnard, both of Anderson County, and George S. Hurst, Roane County, all of Tenn., assignors to Atom Sciences, Inc., Oak Ridge, Tenn.

Filed Nov. 27, 1985, Ser. No. 802,841
Int. Cl.[4] H01J *49/40*
U.S. Cl. 250—282 **22 Claims**



1. A method for improving mass discrimination during an analysis of atoms or molecules in a time-of-flight mass spectrometer, such method conducted within an evacuated chamber, which comprises:

rapidly removing, at a first well defined time, such atoms or molecules to be analyzed from a surface containing such atoms or molecules in a region of a uniform electric field of a selected strength;

rapidly ionizing, at a second well defined time after a selected time delay, T_o, the removed atoms or molecules with an ionizing beam in a defined ionization region spaced a first defined distance, R, from said surface;

accelerating ions, produced by said ionizing beam, in said uniform field region of a second defined distance, S_1;

passing said ions into a field-free region for drifting therein for a third defined distance, S_2;

passing said ions into a relatively short, high-energy acceleration region to strike an ion detector to produce a signal corresponding to the arrival of said ions;

measuring said signal as a function of arrival time to obtain such analysis;

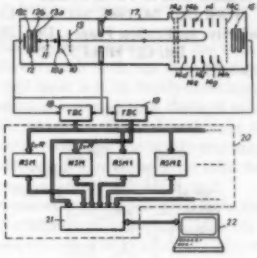
wherein said time delay, said uniform field and said defined distances are chosen to minimize spread in arrival time at said detector of a specified mass within such atoms or molecules.

4,694,168

TIME-OF-FLIGHT MASS SPECTROMETER

Yvon Le Beyec, Bures sur Yvette, and Serge D. Negra, Chilly Mazarin, both of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed Feb. 27, 1985, Ser. No. 706,013
Claims priority, application France, Feb. 29, 1984, 84 03127
Int. Cl.[4] B01D *59/44*
U.S. Cl. 250—287 **6 Claims**



1. A time-of-flight spectrometer comprising a source of ions, an ion mirror receiving ions issued from said source, a first detector disposed to receive ions reflected by the mirror, and a second detector disposed behind the mirror so that a spectrum of the ions reflected by the mirror and received by the first detector can be obtained, as well as a spectrum of any neutral species appearing during flight and received by the second detector,

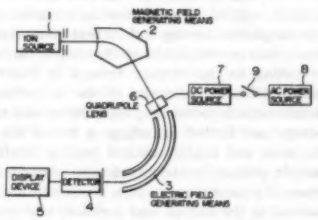
said ion mirror forming with the ion source and the first and second detectors an assembly of axial symmetry, and having a depth sufficient to allow compensation for differences of velocities of ions having the same mass.

4,694,169

MASS SPECTROMETER

Minoru Uchida, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,530
Claims priority, application Japan, Oct. 5, 1984, 59-208236
Int. Cl.[4] H01J *49/30, 49/32*
U.S. Cl. 250—296 **9 Claims**



1. A mass spectrometer including in order along a beam path, ion source means for providing an ion beam along said beam path, magnetic field mass analyzing means, a quadrupole lens, and ion detecting means, said quadrupole lens having two pairs of electrodes, and further comprising:

means for applying variable DC voltages to each electrode of said two pairs of opposing electrodes of said quadrupole lens; and

means for superposing in-phase AC voltages on said DC voltage applied to only one of said two pairs of opposing electrodes of said quadrupole lens so that an output of said detecting means indicates the degree to which the ion

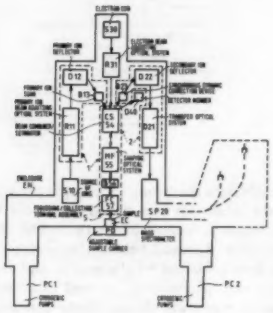
beam is centered on the beam path as it passes through said quadrupole lens.

4,694,170

INSTRUMENT FOR VERY HIGH RESOLUTION IONIC MICRO-ANALYSIS OF A SOLID SAMPLE

Georges Slodzian, Sceaux; Bernard Daigne, Chatenay Malabry, and Francois Girard, Paris, all of France, assignors to Office National d'Etudes et de Recherches Aerospatiales and Universite de Parissud, both of Paris, France

Filed Dec. 24, 1985, Ser. No. 813,145
Claims priority, application France, Dec. 28, 1984, 84 20053
Int. Cl.[4] H01J *37/256*
U.S. Cl. 250—309 **19 Claims**



1. An instrument for micro-analysis of a solid sample, comprising the following items enclosed in an evacuated chamber:

a moving sample carrier means for receiving the sample to be analyzed;

a source of primary ions;

first electrostatic optical means for causing a beam of primary ions from said source to bombard the sample, and for causing beams of secondary electrons and of secondary ions to be emitted by the sample;

an ion analyzer having inlets and including a mass spectrometer;

second electrostatic optical means for collecting the beam of secondary ions emitted by the sample, and for conveying the beam of secondary ions collected in this manner to the inlets of said ion analyzer said first and said second electrostatic optical means including a common and coaxial optical portion having ends, a first pivot center, and having an axis perpendicular to the sample carrier means and extending to the vicinity thereof in order to perform highly efficient collection of the secondary ions while simultaneously processing the primary and secondary ion beams, and further including, at one of the ends of said common and coaxial optical portion furthest from the sample, primary ion beam scanning means for causing said beam of primary ions to scan about said first pivot center located in the axis of said common and coaxial portion, said primary ion beam scanning means being associated with synchronous dynamic correction means for providing synchronous dynamic correction of the beam of secondary ions about a second pivot center located at a cross-over image point provided by said second electrostatic optical means;

separator means for separating the beams of primary and secondary ions; and

autonomous electron observing means for observing the sample and comprising:

magnetic optical means incorporated coaxially with said common and coaxial optical portion, and for being adjustable in a manner which is substantially decoupled from said first and second electrostatic optical means; and

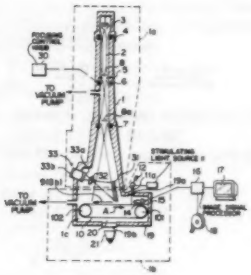
means for applying a transverse magnetic field at the end of the common and coaxial optical portion furthest from the sample causing the beams of secondary electrons and secondary ions emitted from the sample to separate, and for enabling an ion image and an electron image of the sample to be obtained simultaneously.

4,694,171

ELECTRON MICROSCOPE IMAGE FOCUSING USING INSTANTANEOUS EMISSION OF STIMULABLE PHOSPHOR SHEET

Yuichi Hosoi; Nobufumi Mori; Kenji Takahashi, and Junji Miyahara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Nov. 26, 1985, Ser. No. 801,819
Claims priority, application Japan, Nov. 29, 1984, 59-252638
Int. Cl.[4] H01J *37/21, 37/22*
U.S. Cl. 250—311 **6 Claims**



1. A method of recording and reproducing an image produced by an electron microscope, comprising the steps of:

(i) exposing a two-dimensional image sensor under vacum to an electron beam having passed through a specimen;

(ii) detecting instantaneous light emitted from said two-dimensional image sensor upon exposure of the electron beam with an image intensifier to reproduce an image which can be observed by a user of the electron microscope;

(iii) focusing the electron microscope to obtain a desired focused condition using the observed image;

(iv) obtaining a desired field of view of the specimen using the observed image;

(v) thereafter exposing said two-dimensional image sensor under vacum to an electron beam having been transmitted through the specimen to store the energy of the electron beam representative of the image of the specimen on said two-dimensional image sensor;

(vi) applying stimulating energy to said two-dimensional image sensor for discharging light therefrom which represents the stored energy of the electron beam; and

(vii)photoelectrically detecting the light discharged from said two-dimensional image sensor to reproduce the transmitted electron-beam image of the specimen as a final output image thereof under said desired focused condition and/or with said desired field.

4,694,172
DETECTION OF FIRES AND EXPLOSIONS

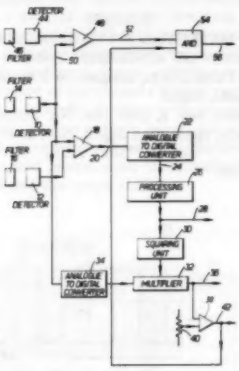
Brian D. Powell, Maidenhead, and David J. Spring, Slough, both of England, assignors to Graviner Limited, Buckinghamshire, England

Filed Oct. 11, 1985, Ser. No. 786,915

Claims priority, application United Kingdom, Oct. 13, 1984, 8425933

Int. Cl.[4] G01C *3/08*; G01J *5/26*

U.S. Cl. 250—339 **10 Claims**



1. A system for producing an output dependent on the distance to a localised source whose temperature is substantially in excess of its ambient atmosphere and which emits corresponding electromagnetic radiation, comprising

first detecting means having a wide field of view and operative to produce a first signal dependent on the electromagnetic radiation received at a first wavelength band at which the received radiation is significantly absorbed by the ambient atmosphere,

second detecting means having a wide field of view and operative to produce a second signal dependent on the electromagnetic radiation received at a second wavelength band which is a discrete emission band corresponding to a band in which the localised source emits radiation and in which there is relatively insignificant absorption by the ambient atmosphere, and

comparing means connected to compare the first and second signals so as to produce a distance-dependent output.

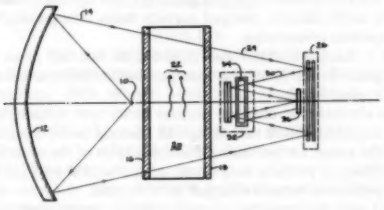
4,694,173
NONDISPERSIVE GAS ANALYZER HAVING NO MOVING PARTS

Jacob Y. Wong, Santa Barbara, Calif., assignor to Hibshman Corporation, San Luis Obispo, Calif.

Filed Oct. 9, 1985, Ser. No. 785,725

Int. Cl.[4] G01N *21/03*; G02F *1/29*

U.S. Cl. 250—343 **35 Claims**



1. Apparatus for use in an analyzer and characterized in having no moving parts, for, in effect, alternately including a reference cell in a beam of radiation and removing the reference cell from the beam of radiation, the reference cell having a window for permitting the beam of radiation to enter the reference cell, said apparatus comprising in combination:

a layer of a material that has selectably a highly-reflective state and a highly-transmissive state, positioned in the beam of radiation ahead of the reference cell so that the beam of radiation is reflected from said layer when said layer is in its highly-reflective state and is transmitted by said layer when said layer is in its highly-transmissive state;

means for reflecting the radiation that has been transmitted into the reference cell back out through the window, so that when said layer is in its highly-transmissive state the beam of radiation is passed back through said layer;

means for alternating the state of said layer between the highly-reflective state and the highly-transmissive state;

means for collecting the total radiation reflected from said layer and emerging from said layer; and,

means for comparing the total radiation collected when said layer is in the highly-reflective state with the total radiation collected when said layer is in the highly-transmissive state.

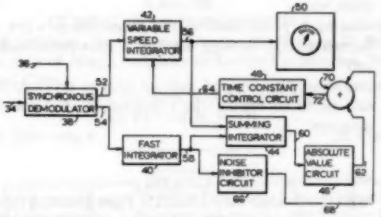
4,694,174
INFRARED GAS DETECTOR

Louis W. Erath, Abbeville, La., assignor to Gas Alarm Service, Inc., Abbeville, La.

Filed Oct. 1, 1985, Ser. No. 782,516

Int. Cl.[4] G01N *21/61*

U.S. Cl. 250—345 **15 Claims**



1. In a gas analyzer using a twin beam infrared absorption gas detector comprised of a reference chamber filled with a sample of a reference gas, a sample chamber partitioned into a first detection zone and a second detection zone by a flexible diaphragm, the flexible diaphragm being deformably responsive to a pressure differential between the first detection zone and the second detection zone, the first and second detection zones being filled with a sample of the reference gas, a first source of infrared energy for directing a first infrared beam through the reference chamber into the first detection zone, a second infrared source for directing a second infrared beam through the sample chamber into the second detection zone, and output circuitry adapted to produce an output signal substantially proportional to the deformation of the diaphragm, the improved signal processor comprising:

(a) a variable speed integrator having an output and adapted to produce a signal substantially proportional to the concentration of the reference gas in the sample chamber, the variable speed integrator having an adjustable time constant;

(b) circuitry adapted to adjust the time constant of the variable speed integrator responsive to the rate of change of the output signal substantially proportional to the deformation of the diaphragm; and

(c) display means adapted to display the signal produced at

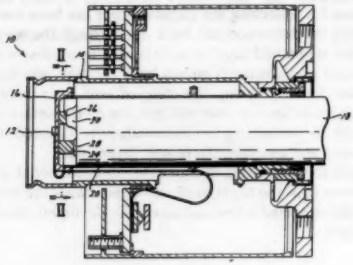
the output of the variable speed integrator as the concentration of the reference gas in the sample chamber.

4,694,175

THERMAL DAMPER FOR INFRARED DETECTOR

Joseph S. Buller, Santa Barbara, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Dec. 12, 1985, Ser. No. 807,924
Int. Cl.[4] G01J *1/04*
U.S. Cl. 250—352 **20 Claims**



1. A method for reducing temperature variation in an infrared detector, said method comprising the steps of:

providing a source of thermal energy operable to cool said detector, the temperature of said source of thermal energy varying according to a predetermined frequency;

dividing the flow of thermal energy between said source and said detector into at least two paths each having a temperature wave;

producing a phase shift in the temperature wave of the thermal energy flowing through at least one of said paths; and

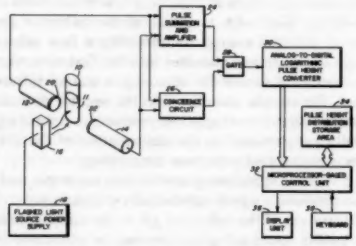
recombining the flow of thermal energy through each of said paths to reduce the temperature variation in said detector.

4,694,176

METHOD AND APPARATUS FOR INDICATING QUENCH OF A LIQUID SCINTILLATION SOLUTION

Donald L. Horrocks, Placentia, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 612,180, May 21, 1984, abandoned.
This application Jan. 10, 1986, Ser. No. 818,059
Int. Cl.[4] G01T *1/204*
U.S. Cl. 250—362 **13 Claims**



1. A method for measuring a value related to quench associated with a liquid scintillation solution wherein the solution includes a sample, a solvent and a solute, the method including the steps of:

generating light flashes wherein the light includes a predetermined wavelength for exciting essentially only the solvent;

exposing the solution to the light flashes;

detecting a pulse height spectrum for scintillations produced in the solution in response to the light flashes;

determining a unique point on the pulse height spectrum; and

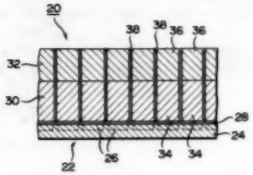
relating the unique point to a corresponding pulse height value, such pulse height value providing a value related to quench associated with the solution.

4,694,177

RADIATION DETECTOR HAVING HIGH EFFICIENCY IN CONVERSION OF ABSORBED X-RAYS INTO LIGHT

Yoshimi Akai, Yaita, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 1, 1985, Ser. No. 793,860
Claims priority, application Japan, Nov. 2, 1984, 59-230260
Int. Cl.[4] G01T *1/202*
U.S. Cl. 250—368 **6 Claims**



1. A radiation detector having high efficiency in conversion of absorbed X-rays into light, comprising:

scintillator elements for receiving radiation and emitting light;

a light-transmitting member formed of a material having higher light-transmission factor than that of the scintillator elements, and capable of absorbing radiation; and

a semiconductor light-detecting member for converting the light emitted from the scintillator elements and transmitted through the light-transmitting member into an electrical signal,

said light-transmitting member being stacked contiquously on the scintillator elements by hot isostatic pressing, and disposed between the scintillator elements and the light-detecting member.

4,694,178

MULTIPLE CHANNEL ELECTRON BEAM OPTICAL COLUMN LITHOGRAPHY SYSTEM AND METHOD OF OPERATION

Kenneth J. Harte, Carlisle, Mass., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Jun. 28, 1985, Ser. No. 749,796
Int. Cl.[4] G21K *1/08*; H01J *3/14, 3/26*
U.S. Cl. 250—396 R **39 Claims**

1. An electrostatic charged particle beam optical column for use in multi-channel charged particle beam lithography/readout systems comprising:

(i) a charged particle gun mounted at one end of an elongated housing having a target surface supported at the opposite end;

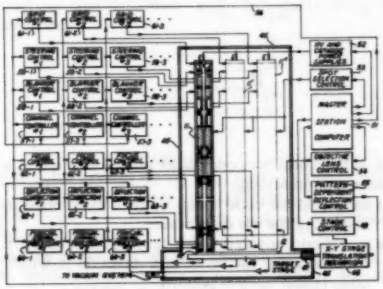
(ii) electrostatic charged particle beam spot shaping means mounted within said elongated housing in the direction of the target surface along the optical axis of the undeflected charged particle beam path of a charged particle beam produced by said charged particle gun;

(iii) said electrostatic charged particle beam spot shaping means including first and second spot shaping apertured plate members separated by first spot shaping electrostatic

deflector means for imaging the aperture of the first spot shaping apertured plate member onto the second spot shaping apertured plate member to thereby produce a partially truncated image of the aperture of the first spot shaping apertured plate for application to the target surface, and second spot shaping electrostatic deflector means following the second spot shaping apertured plate member for restoring the partially truncated charged particle beam image of the first spot shaping aperture back to the optical axis of the undeflected charged particle beam path to thereby avoid the need to correct the charged particle beam spot position at the target surface as the charged particle beam shape is varied;

(iv) electrostatic condenser lens means positioned in said elongated housing intermediate the second spot shaping electrostatic deflector means and the target surface for demagnification of the shaped charged particle beam spot to allow for physically shortening the overall length of the electrostatic charged particle beam optical column;

(v) shaped charged particle beam spot electrostatic deflector means mounted intermediate the electrostatic condenser lens means and the target surface;



(vi) said shaped charged particle beam spot electrostatic deflector means comprising a three stage octopole deflector having first, second and third octopole deflector sections arrayed axially in the order named along the optical axis of the charged particle beam optical column and alternately supplied with deflection voltages and correction voltages; and

(vii) objective lens means positioned ahead of the third and following the first and second octopole deflector sections whereby the central rays of the shaped charged particle beam as they enter the combined three stage octopole deflector and objective lens system in the path toward the target surface are caused by the first and second octopole deflector sections to pass through the center of the objective lens means at an angle proportional to the desired deflection, and thereafter pass through the third octopole deflector section and exit at a point spaced from the center axis of the undeflected charged particle beam path by a distance proportional to the desired deflection and on a path orthogonal to the target surface.

4,694,179

SYMBIOTIC FILTER-STERILIZER

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005, and Michael Stranahan, 2858 Woody Creek Rd., Woody Creek, Colo. 81656

Filed May 27, 1986, Ser. No. 866,893
Int. Cl.[4] G01N *21/01*
U.S. Cl. 250—431 **4 Claims**

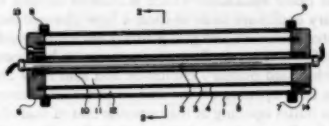
1. A symbiotic filter-sterilizer for filtering and sterilizing a fluid, comprising in combination:

(a) a cylindrical shell having a first and a second closed ends;

(b) a tubular filter having a porous cylindrical wall disposed within said cylindrical shell wherein said tubular filter extending from said one closed end to said the other closed end provides a first annular compartment intermediate said cylindrical shell and said tubular filter;

(c) a transparent tubular shield transmitting ultraviolet rays disposed within said tubular filter, wherein said transparent tubular shield extending from said one closed end to said the other closed end provides a second annular compartment intermediate said tubular filter and said transparent tubular shield;

(d) at least one elongated germicidal lamp for emiting ultraviolet rays disposed within said transparent tubular shield;



(e) at least one port open to said first annular compartment providing a flow passage for fluid; and

(f) at least one port open to said second annular compartment providing a flow passage for fluid;

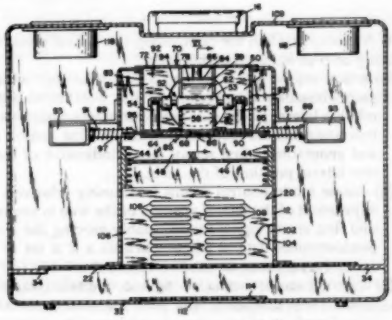
wherein the ultraviolet rays emitted by said germicidal lamp sterilizes the fluid being circulated through said first and second annular compartments and filtered by said tubular filter, and cleans said tubular filter by oxidizing particles clogging up the pores of said tubular filter, while said tubular filter enhances the sterilizing effect of said germicidal lamp by distributing the fluid flow for uniform exposure to the ultraviolet rays.

4,694,180

CURING OVEN FOR ADHESIVE

Richard Salisbury, Norfolk, and Stephen W. Wyman, N. Attleboro, both of Mass., assignors to Loctite Corporation, Newington, Conn.

Filed Sep. 20, 1985, Ser. No. 778,214
Int. Cl.[4] G01N *23/00*
U.S. Cl. 250—455.1 **22 Claims**



1. Curing oven for adhesive which is curable by ultraviolet radiation, said oven comprising:

(a) a housing having a curing chamber for containing an item which has an adhesive which is curable by ultraviolet radiation, said housing having an access opening to said chamber which enables said item to be inserted into and removed from said chamber,

(b) an openable closure member for said access opening,

(c) an ultraviolet lamp which is located above said curing chamber, said lamp being effective when energized to become heated and for generating ultraviolet radiation within a predetermined temperature range of said lamp,

(d) a primary enclosure for said lamp, said primary enclosure having a top opening which is directly above said lamp and a bottom opening which is directly below said lamp for the entire length of said lamp, said bottom opening forming an opening to said curing chamber to enable ultraviolet radiation to pass from said lamp to said curing chamber, said primary enclosure completely enclosing said lamp except for said top and bottom openings, said lamp causing air within said primary enclosure to become heated and said top and bottom openings enabling an upward convective air flow to develop from said bottom opening to said top opening across said lamp for cooling said lamp,

(e) an outer enclosure which is located outside of said primary enclosure so as to form a flow channel between said outer enclosure and said primary enclosure, said top opening forming an air flow communication between the space within said primary enclosure and said flow channel,

(f) an inlet opening at one end of said flow channel,

(g) an outlet opening at the opposite end of said channel, and

(h) a fan for creating a horizontal air flow through said flow channel from said inlet opening to said outlet opening and above said top opening for removing heated air which passes through said top opening from said convective air flow for maintaining the temperature of said lamp within said predetermined temperature range.

4,694,181

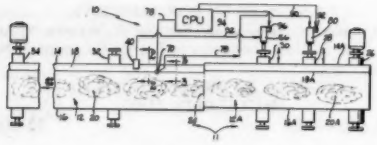
WEB LATERAL POSITION CONTROL SYSTEM USING BOTH COARSE AND FINE MODE CONTROL MEANS

Richard G. Piller, 1500 W. 92nd, Denver, Colo. 80221

Filed Jul. 7, 1986, Ser. No. 882,391

Int. Cl.[4] G01N *21/86;* G06K *7/015*

U.S. Cl. 250—548 **14 Claims**



1. A control system for controlling the lateral position of a moving web of material comprising:

(a) a first sensor means having a first relatively wide scan path extending transversely of the web for sensing the relative lateral position of preselected web lateral position indicating indicia associated with the first sensor means and generating a first sensor signal indicative of the relative lateral position of the web;

(b) coarse mode control means for causing relatively rapid adjustment of the lateral position of the web in response to said first sensor signal for adjustably moving the web to a predetermined lateral position within a first set of tolerances during a coarse mode of control;

(c) a second sensor means having a second relatively narrow transversely extending scan path for sensing the relative lateral position of preselected web lateral position indicating indicia associated with the second sensor means and generating a second sensor signal indicative of the relative lateral position of the web;

(d) fine mode control means for causing adjustment of the lateral position of the web in response to said second sensor signal for maintaining the web in said predetermined lateral position within a second set of tolerances in a fine mode of control;

(e) control mode switching means for switching from said fine control mode to said coarse control mode whenever said web position indicating indicia associated with said second sensor are not detected thereby for a predetermined period of time and for switching from said coarse control mode to said fine control mode whenever said second sensor continuously detects the presence of said web position indicating indicia associated therewith for a predetermined period of time.

4,694,182

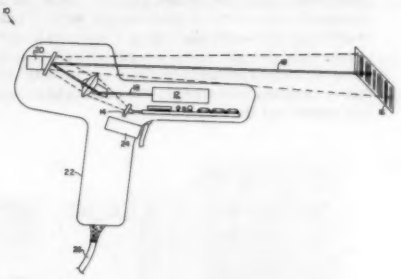
HAND HELD BAR CODE READER WITH MODULATED LASER DIODE AND DETECTOR

P. Guy Howard, Junction City, Oreg., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Feb. 27, 1986, Ser. No. 834,286

Int. Cl.[4] G06K *7/10*

U.S. Cl. 250—566 **3 Claims**



1. A hand held bar code reader using a laser diode as a beam generator, comprising,

a hand held bar code reader body, with external means for activating the bar code reader,

a laser diode mounted within the body in position to project a beam out of the body, in a direction in which the bar code reader body is pointed,

scanning means for scanning the beam of the laser diode,

detector means mounted within the body, for reading a reflected light signal from a bar code over which the beam from the laser diode is scanned,

power supply means for supplying power to the laser diode and the detector means,

diode modulation means for causing the laser diode to project the laser beam in intermittent pulses, at regular intervals, the intervals being sufficiently short to still assure that a shortest bar interval of the bar code can be read,

detector modulation means for causing the detector to read only intermittently, including detector readings simultaneous with pulses of the laser and including detector readings timed between pulses, and

differencing means connected to the detector means for subtracting the detector signal obtained between laser beam pulses, representing ambient light, from the detector signal read simultaneously with laser beam pulses, representing laser plus ambient light,

whereby accurate bar code readings can be obtained even in strong and fluctuating ambient light conditions.

4,694,183

OPTICAL ISOLATOR FABRICATED UPON A LEAD FRAME

Stephen P. Merrick, Sunnyvale, and Robert W. Teichner, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 25, 1985, Ser. No. 748,520

Int. Cl.[4] H01L *31/12*

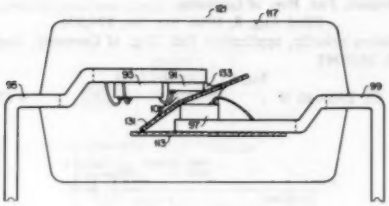
U.S. Cl. 250—551 **10 Claims**

1. An optical isolator comprising:

an LED lead;

an LED attached to an underside of the LED lead;

a photodiode lead extending under the LED lead; a photodiode die attached to a topside of the photodiode lead in alignment with the LED die and separated from the LED die across an isolation gap;



a first dielectric sheet attached to a top side of the LED lead;

a second dielectric sheet attached to a bottom side of the photodiode lead; and,

an optically transmissive material located between the first and second dielectric sheets and substantially filling the isolation gap.

4,694,184

COORDINATE MEASURING METHOD AND DEVICE USING A CONTACT MEMBER

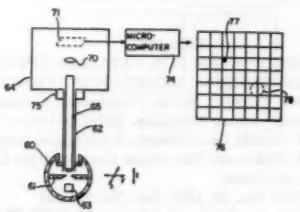
Timothy R. Pryor, Tecumseh, Canada, assignor to Diffracto Ltd., Windsor, Canada

Continuation of Ser. No. 592,028, Mar. 22, 1984, Pat. No. 4,583,000, which is a continuation of Ser. No. 207,081, Nov. 14, 1980, Pat. No. 4,453,082. This application Feb. 21, 1986, Ser. No. 831,724

The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.

Int. Cl.[4] G01N *21/86*

U.S. Cl. 250—561 **10 Claims**



1. Apparatus for optically sensing the presence of an object in a plane perpendicular to a reference axis, said device comprising:

a contact member disposed in said plane and movable in all directions in said plane, said contact member being a ball contact member;

means for mounting said ball contact member for movement in a direction orthogonal to said plane;

means for directing light along the reference axis; and

detector means for detecting a reference condition of the light when said contact member is in a rest position thereof, and for detecting a different condition of the light when the position of said contact member is changed from said rest position by contact with an object.

4,694,185

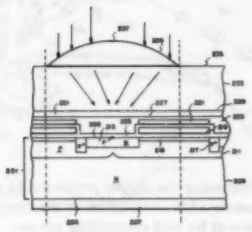
LIGHT SENSING DEVICES WITH LENTICULAR PIXELS

Armin K. Weiss, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 18, 1986, Ser. No. 853,330

Int. Cl.[4] H01L *27/14*

U.S. Cl. 250—578 **13 Claims**



1. A light sensing semiconductor device including an array of light sensing pixels comprised of

a semiconductive substrate, at least a portion of said substrate being of a first conductivity type, and laterally spaced regions of a second conductivity type forming within individual pixels a single light sensing portion spaced laterally inwardly from at least two opposed pixel edges and

means for transmitting incident light to said light sensing portion including

a lens presenting a convex surface capable of receiving light laterally outwardly of said light sensing portion and directing the light toward said light sensing portion, and

a light transmissive portion interposed between said lens and said light sensing portion,

characterized in that in at least one of said pixels

said light transmissive portion is comprised of a lens supporting layer having a thickness exceeding that of said lens,

said lens is laterally confined on said lens supporting layer and spaced laterally inward from at least said two opposed pixel edges, and

said lens supporting layer and said lens are formed of different polymers, said supporting layer polymer exhibiting a higher glass transition temperature than said lens polymer and said lens polymer at its glass transition temperature being resistant to wetting the laterally surrounding surface of said lens supporting layer.

4,694,186

SYSTEM FOR PHOTOELECTRIC DETECTION

Ruri Onoda, Tokyo; Yoichi Kuroki, Kawasaki, and Gen Nakamura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 5, 1985, Ser. No. 772,713

Claims priority, application Japan, Sep. 10, 1984, 59-188083; Oct. 12, 1984, 59-212605; Nov. 5, 1984, 59-231405

Int. Cl.[4] H01J *40/14*; G01C *3/08*

U.S. Cl. 250—578 **17 Claims**

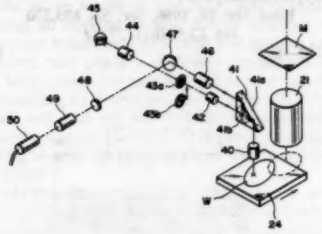
1. A system for photoelectrically detecting an object, comprising:

means for illuminating the object;

means for photoelectrically detecting the object being illuminated by said illuminating means, said detecting means producing an output in response to the detection;

means for controlling light to be directed, by way of the

object, to said detecting means from said detecting means; and



means for processing the output produced by said detecting means upon or after completion of the controlling operation performed by said controlling means.

4,694,187

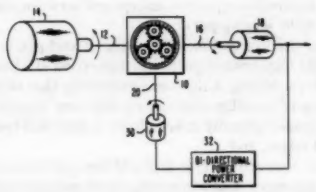
ELECTROMECHANICAL CONSTANT SPEED DRIVE GENERATING SYSTEM

Donal E. Baker, American Township, Allen County, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 13, 1986, Ser. No. 818,466

Int. Cl.[4] F02N *11/08*

U.S. Cl. 290—4 R **11 Claims**



1. An electromechanical constant speed drive generating system comprising:

a mechanical differential having first, second and third rotatable shafts, wherein the speed of said second shaft is equal to the speed of said first shaft multiplied by a first constant plus the speed of said third shaft multiplied by a second constant;

means for driving said first shaft at a variable speed ranging from a lower predetermined speed to an upper predetermined speed;

a constant speed generator connected in a driving relationship with said second shaft, for producing a constant frequency output;

a variable speed dynamoelectric machine connected in a driving relationship with said third shaft;

a unidirectional power converter electrically connected between the output of said constant speed generator and said variable speed dynamoelectric machine to transfer unidirectional power between the output of said constant speed generator and said variable speed dynamoelectric machine, thereby varying the speed of said variable speed dynamoelectric machine such that the speed of said second shaft remains substantially constant when the speed of said first shaft is varied between said lower and upper predetermined speeds.

4,694,188

APPARATUS FOR CONTROLLING A TURBO GENERATOR

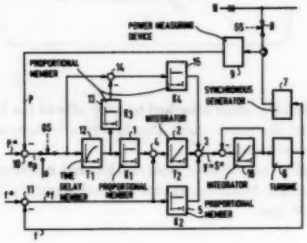
Dieter Diegel, Rottenbach; Gerhard Plohn, Erlangen, and Manfred Schuh, deceased, late of Erlangen, all of Fed. Rep. of Germany (by Gisela Schuh, Sabine Schuh, Michael Schuh, heirs), assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 8, 1986, Ser. No. 894,936

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1985, 3529291

Int. Cl.[4] G05B *11/06*

U.S. Cl. 290—40 B **4 Claims**



1. An apparatus for controlling a turbo generator having a speed and a power controller, each of which have integral behavior, comprising:

common integrator means for the speed and the power controller (for providing the integral behavior;

a first proportional member means having as an input a signal derived from a power deviation signal representing a difference between a preset reference power value and an actual power value and an output coupled to an input of the common integrator means, a speed deviation signal comprising the difference between a reference speed value and an actual speed value being coupled additively to said common integrator means input; and

a second proportional member means having as an input the speed deviation signal for forming a proportional amplification of the speed controller, the output signal of said second proportional member means being added to the output of the common integrator means.

4,694,189

CONTROL SYSTEM FOR VARIABLE SPEED HYDRAULIC TURBINE GENERATOR APPARATUS

Eiji Haraguchi, Ibaraki; Hiroto Nakagawa, Osaka; Akira Bando, Hitachi; Takao Kuwahara, Hitachi; Haruo Nohara, Hitachi, and Kenichi Ono, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo and The Kansai Electric Power Co., Inc., Osaka, both of, Japan

Filed Sep. 24, 1986, Ser. No. 911,131

Claims priority, application Japan, Sep. 25, 1985, 60-210004; Sep. 25, 1985, 60-210005

Int. Cl.[4] F01D *15/10*

U.S. Cl. 290—40 C **10 Claims**

1. A control system for variable speed hydraulic turbine generator apparatus comprising:

an induction generator connected at its primary side to an AC power line system;

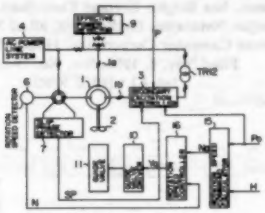
a secondary excitation controller connected to the secondary side of said induction generator and being responsive to a generator output command signal supplied externally to supply to said induction generator an excitation current which causes said induction generator to generate AC power at the same frequency as that on said AC power line system;

a hydraulic turbine for rotating said induction generator;

a guide valve for regulating the amount of water supplied to said hydraulic turbine;

a rotation speed detector for detecting a rotation speed of said induction generator;

a rotation speed command calculator for receiving a hydraulic turbine running condition signal inclusive of said external generator output command signal and calculating an optimum rotation speed command;



a rotation speed controller for comparing said optimum rotation speed command with a rotation speed signal from said rotation speed detector and producing a guide valve opening control signal in accordance with a difference between said optimum rotation speed command and said rotation speed signal: and

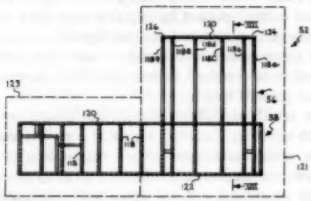
a guide valve drive responsive to said guide valve opening control signal to deliver to said guide valve a signal which controls the opening of said guide valve in accordance with said guide valve opening control signal.

4,694,190

INTEGRAL GENERATOR HOUSING AND BASE FOR A TURBINE GENERATOR

Bruce B. Lane, Westford; Douglas F. Westerkamp, Harvard, and Peter P. Clifford, Leominster, all of Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 23, 1985, Ser. No. 811,982
Int. Cl.[4] H02K *7/18*
U.S. Cl. 290—52 **9 Claims**



1. A turbine generator comprising:

an integral generator housing-base including a base having a bottom and a generator housing having an upper end, said integral generator housing-base being formed by a plurality of spaced-apart transverse webs and plates interconnecting said transverse webs; a first set of said transverse webs extending from said bottom to said upper end to integrally form both said base and said generator housing;

a turbine;

means for mounting said turbine on said integral generator housing-base;

a generator stator mounted within said generator housing; and

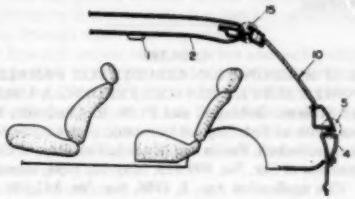
said generator housing including means for permitting installation of a generator rotor coupled to said turbine and operatively associated with said generator stator.

4,694,191

LAMP POWER SUPPLY CONTROL SYSTEM FOR AN AUTOMOTIVE VEHICLE

Toru Segoshi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Feb. 7, 1986, Ser. No. 826,977
Claims priority, application Japan, Feb. 25, 1985, 60-34519
Int. Cl.[4] B60Q *7/00, 3/02*
U.S. Cl. 307—10 LS **9 Claims**



1. A system for controlling a power supply to a lamp for an automotive vehicle having a body, comprising:

(a) first switch means operatively associated with at least one of the body of the vehicle and a door, said first switch means opened when the door of the vehicle is closed to seal an opening in the vehicle body and closed when the door is open;

(b) second switch means operatively associated with at least one of the body of the vehicle and the door, said second switch means opened only when the back door is detached from the vehicle body and remaining closed when the door is attached to the vehicle body;

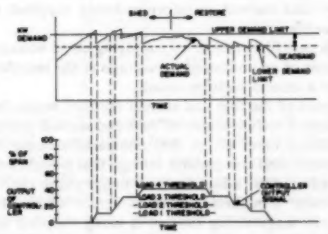
(c) a lamp connected in a series with said first and second switch means and a power source so that said lamp receives power only when said first and second switch means are closed.

4,694,192

SIMPLIFIED DEMAND LIMIT CONTROL

Peter P. Payne, Wheeling Cook, and William T. Pienta, Prospect Heights, both of Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 23, 1984, Ser. No. 674,447
Int. Cl.[4] H02J *3/14*
U.S. Cl. 307—39 **9 Claims**



1. A demand control system for maintaining power consumption of loads within a building below a demand limit comprising:

power demand controller means responsive to power consumption of said loads for providing a controller output signal changing in a first direction when said power consumption is above said demand limit and changing in a second direction when said power consumption is below said demand limit;

a communication channel connected to said power demand controller means for carrying said signal; and,

at least one demand load controlling means connected to said communication channel to be responsive to a threshold of said controller output signal, said demand load controlling means having a deenergization state and an energization state, said demand load controlling means capable of having one of said states when said controller output signal is above said threshold and the other of said states when said controller output signal is below said threshold.

4,694,193

FAULT RECOGNITION CIRCUIT FOR PARALLEL POWER SUPPLY DEVICES FEEDING A USER

Manfred Schlenk, Bobingen, and P. N. R. Chadwick, Petzenhausen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

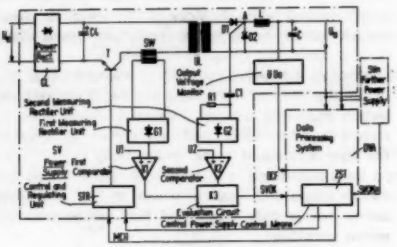
Continuation of Ser. No. 609,425, May 11, 1984, abandoned.

This application Apr. 3, 1986, Ser. No. 847,108

Claims priority, application Fed. Rep. of Germany, May 27, 1983, 3319306

Int. Cl.[4] G05F *1/64*; H02M *7/23*

U.S. Cl. 307—62 **8 Claims**



1. A fault recognition system, comprising:

at least two power supplies connected in parallel to a user at their outputs, each of the power supplies having at least one electronic switch, a power transformer, and a rectifier portion with a following filter;

each of the power supplies having

a control and regulating means connected to the electronic switch for controlling the same,

a current transformer connected between said electronic switch and said power transformer, a load side voltage of said current transformer being supplied to a first rectifier means,

high pass filter means for supplying an ac voltage component of an unfiltered dc voltage at the rectifier portion to a second rectifier means,

outputs of the first and second rectifier means being connected to first inputs of first and second comparators,

a second input of the first comparator being connected with a first comparison voltage that is higher than a test voltage that arises due to a magnetizing current of the power transformer so as to detect when substantially only magnetizing current is being supplied and thus a possible open circuit to the user, and a second input of the second comparator being connected with a second comparison voltage that is lower than the ac voltage component of the unfiltered dc voltage which appears given a minimum permissible line input voltage of the power supply, and

outputs of the first and second comparators being connected to respective first and second inputs of an evaluation circuit; and

an output of the evaluation circuit in the power supplies being connected to an external power supply control means for influencing the respective control and regulating means in the respective power supply.

4,694,194

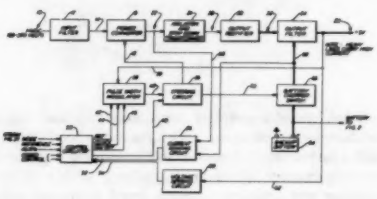
POWER SUPPLY WITH BATTERY BACKUP

Allen Hansel, Sea Bright; Ermand Centofanti, Allenwood, and Thingarajan Natarajan, Englishtown, all of N.J., assignors to Concurrent Computer Corporation, Holmdel, N.J.

Filed Nov. 4, 1985, Ser. No. 794,920

Int. Cl.[4] H02J *9/00*

U.S. Cl. 307—66 **7 Claims**



1. A power supply system with a battery backup which is switched into the supply when the AC line fails and switched out of the supply when the AC line is available, the switching occurring with a minimum effect on the supply output, the power supply system comprising, in combination:

a high voltage direct current module responsive to the AC line to produce a high voltage direct current output;

converter means responsive to an externally generated pulse width modulated control signal to convert said high voltage direct current output into a low voltage pulsed output, said low voltage pulsed output having the same duty cycle as said pulse width modulated control signal;

a backup battery;

a reference source for producing a reference voltage;

a battery chopper switch responsive to an externally generated pulse width modulated control signal to produce a pulsed battery output having the same duty cycle as said pulse width modulated control signal;

output filter means responsive to said low voltage pulsed output or said pulsed battery output to produce a filtered direct current output;

a pulse width modulator circuit for producing said pulse width modulated control signal at a given frequency, said pulse width modulator circuit responding to said direct current output and said reference so as to produce a pulse width modulated control signal with a greater duty cycle if said direct current output falls relative to said reference voltage and to produce a pulse width modulated control signal with a smaller duty cycle if said direct current output rises relative to said reference voltage;

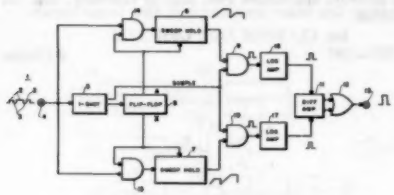
a steering circuit responsive to said pulse width modulated signal and an externally generated steering signal to couple said pulse width modulated signal to either said battery chopper switch or said means to convert as a function of said steering signal; and

microcomputer means, responsive to the failing of said AC line voltage, to change said steering signal so that said pulse width modulated signal is applied by said steering circuit to said battery chopper switch, said steering signal changing state at the time where said pulse width modulated signal when applied to either said battery chopper or said means to convert will produce the same filtered direct current output.

4,694,195
RATIO ANALYZER

Troy L. Stueck, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 6, 1965, Ser. No. 493,593
Int. Cl.[4] H03K *5/26;* **H04L** *15/24*
U.S. Cl. 307—234 **3 Claims**

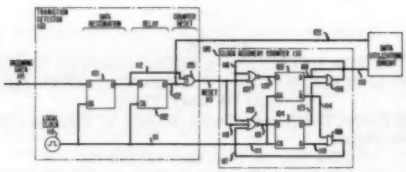


1. A ratio analyzer for providing an output voltage that is a function of the ratio of successive mark-space intervals of a pulsed communication input signal, the said analyzer comprising: a first means including a monostable multivibrator and a bistable multivibrator for providing an output corresponding to the mark-to-mark intervals of the said input signal and providing a sampling signal output; a second means including a sweep time base generator and voltage storage, responsive to the said first means and the said input signal, providing an output voltage proportional to said mark-space interval of said input signal; a third means including an AND gate responsive to the said sampling signal of said first means and the said output voltage of said second means, providing an output voltage proportional to the mark-space interval of said input signal; a fourth means including a logarithmic amplifier responsive to said third means and providing an output voltage proportional to the logarithm of the said output voltage of said third means; and means including a difference amplifier responsive to the output voltage of said fourth means for providing an output signal that is proportional to the difference in the logarithms of said successive mark-space interval of the said input signal, said difference signal being a function of the ratio of the said intervals.

4,694,196
CLOCK RECOVERY CIRCUIT

Lloyd A. Hasley, Carrollton, Tex., and Jaan Raamot, Broomfield, Colo., assignors to American Telephone and Telegraph Company and AT&T Information Systems, Holmdel, N.J.

Filed Dec. 7, 1984, Ser. No. 679,458
Int. Cl.[4] H03L *7/06;* **H03K** *1/17*
U.S. Cl. 307—269 **2 Claims**



1. A circuit for deriving the clock of an incoming data signal, said circuit comprising:

a local clock source for generating local clock pulses having a nominal rate of 3 times the expected clock rate of said incoming signal,

an input on said detector for receiving said incoming signal,

means within said detector for delaying said received incoming signal by storing said received incoming signal in response to said received incoming signal and said local clock pulses and for producing a first delayed signal on a first output of said detector a second delayed signal,

means in said detector responsive to each transition of said delayed signal and said second delayed signal for generating a counter reset pulse on a second output of said detector,

first and second counter latches having inputs and outputs,

gating means interconnecting inputs and outputs of said counter latches for operating said counter latches as a modulo-3 counter in response to said local clock pulses,

said first and second counter latches and said gating means responsive to said local clock pulses for cyclically advancing through three counting positions,

said first and second counter latches and said gating means responsive to the generated counter reset pulse received from said second output terminal of said detector for resetting said counter to its first counting position,

said first latch further responsive for generating a derived clock pulse each time said counter advances to its third counting position,

a utilization circuit,

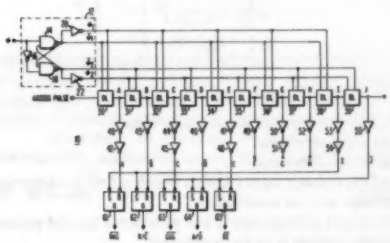
said means within said detector for delaying in response to said received incoming signal and said local clock pulses for transmitting said delayed signal from the first output of said detector to a first input of said utilization circuit, and

said first latch in response to each time said counter advances to its third counting position for transmitting each derived clock pulse to a second input of said utilization circuit whereby said utilization circuit registers the delayed signal extant on the first input of said utilization circuit at the time said derived clock pulse is applied to the second input of said utilization circuit.

4,694,197
CONTROL SIGNAL GENERATOR

David L. Sprague, Hopewell, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 6, 1986, Ser. No. 816,283
Int. Cl.[4] H03K *5/06;* **H03L** *7/00*
U.S. Cl. 307—269 **5 Claims**



1. an apparatus for generating a plurality of rectangular-wave control signals timed from a single input clock signal having a given frequency, said apparatus comprising:

a plurality of N data latches having respective input and output terminals connected to place said data latches in cascade connection, and being consecutively ordinally numbered first through N^{th} in order of their arrangement in said cascade connection;

pulse generating means for applying pulses at selected times to the input terminal of said first data latch;

means for producing first annd second non-overlapping timing timing signals from said clock signal, said first timing signal being applied only to the odd-numbered data latches and said secodn timing signal being applied only to the even-numbered data latches to clock a stream of ONEs and ZEROs through said cascade connection of said N data latches in a serial shift register operation, said

ONEs being generated by said first data latch when pulses are applied to its input terminal and said ZEROs being generated by said first data latch between pulses being applied to its input terminal; and

means responsive to digital signals from the output terminals of said data latches for generating said plurality of rectangular-wave control signals, which means comprises

a plurality of flip-flops, each having respective set and reset terminals connected to the output terminals of different ones of said data latches and having a respective output terminal to produce a respective one of said rectangular-wave control signals.

4,694,198

SCHMITT TRIGGER CIRCUIT

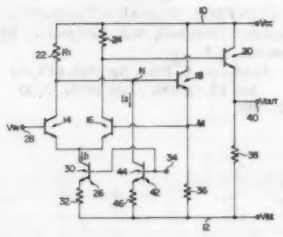
Yoshitaka Umeki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 29, 1986, Ser. No. 890,263

Claims priority, application Japan, Jul. 29, 1985, 60-167346

Int. Cl.[4] H03K *3/295*

U.S. Cl. 307—290 **6 Claims**



1. A Schmitt trigger circuit comprising

(a) an input terminal,

(b) an output terminal,

(c) a first voltage supply line at which a first predetermined voltage is to be established,

(d) a second voltage supply line at which a second predetermined voltage is to be established,

(e) a first transistor having its base connected to the input terminal,

(f) a load resistor through which the first transistor has its collector connected to said first voltage supply line,

(g) a second transistor having its collector connected to said first voltage supply line,

(h) first constant-current source means through which said first and second transistors have their respective emitters commonly connected to said second supply voltage line,

(i) a third transistor having its collector connected to the first voltage supply line, its base connected to the first voltage supply line through the load resistor and to the collector of the first transistor and its emitter connected to the base of the second transistor, and

(j) a second constant-current source through which the third transistor has its base further connected to the second voltage supply line.

4,694,199

CIRCUIT ARRANGEMENT FOR PRODUCING A FLUCTUATION-FREE D-C VOLTAGE LEVEL OF A D-C VOLTAGE

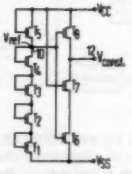
Jürgen R. Goetz, Oberneuching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 422,186, Sep. 23, 1982, abandoned. This application Apr. 16, 1986, Ser. No. 853,385

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1981, 3138558

Int. Cl.[4] H03K *3/01;* **G05F** *3/16*

U.S. Cl. 307—297 **3 Claims**



1. Circuit arrangement for producing a fluctuation-free d-c voltage level from a fluctuating d-c supply voltage, comprising a first and a second circuit stage, the first circuit stage acting as a voltage divider having a first plurality of series connected MOS-transistors, each transistor therein having its gate connected to its drain, said first plurality of MOS-transistors being connected between the supply voltage and a frame reference potential and including a first part, a second part and a tap between said first and second parts, the second part including at least one of said first plurality of MOS-transistors and being disposed between the fluctuating supply voltage and the tap, the first part including the remainder of said first plurality of MOS-transistors and being disposed between the tap and the frame reference potential, the tap serving for supplying a tap reference potential; said second circuit stage including a second plurality of MOS-transistors located between the d-c supply voltage and said frame reference potential, the second plurality of MOS-transistors including at least a first MOS-transistor connected with its drain to the d-c supply voltage, a second MOS-transistor connected with its source to the frame reference potential and a middle MOS-transistor disposed between said first and second MOS-transistors, the first and second MOS-transistors being connected with their gates to said tap reference potential and said middle MOS-transistor being connected with its gate to the d-c supply voltage; said remainder of said first plurality of MOS-transistors including at least four of said MOS-transistors; the connection between said first MOS-transistor of said second circuit stage and said middle transistor forming the output of the circuit arrangement and producing the fluctuation-free d-c voltage level.

4,694,200

DEVICE FOR DETECTING A PULSE TRAIN IN NOISE AND APPLICATION TO A RADIONAVIGATION AID SYSTEM OF DME TYPE

Joseph Hetyei, Bouffemont, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 25, 1986, Ser. No. 833,734

Claims priority, application France, Mar. 5, 1985, 85 03228

Int. Cl.[4] H03K *5/153*

U.S. Cl. 307—358 **9 Claims**

1. A device for detecting a pulse train, said train comprising a plurality of pulses, said device comprising:

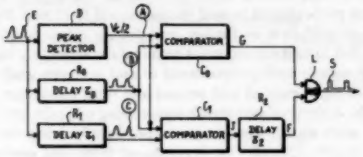
means for detecting the peak value of the first pulse of said train;

first analog delay means receiving said pulse train and conferring thereon a first delay for forming a first output signal;

a first comparator for comparing the level of said first output signal with the half of said peak value and delivering a first signal when said first output signal becomes equal to said half peak value and as long as said first output signal remains greater than said half peak value;

second analog delay means receiving said pulse train, conferring thereon a second delay, different from said first delay for forming a second output signal;

a second comparator comparing the level of said second output signal with said half peak value and with said first



output signal and delivering a second signal when said second output signal becomes equal either to said half value or to said first output signal, and delivering said second signal from the second comparator as long as said second output signal remains greater than the greatest of said half value and said first output signal;

logic means receiving said first and second signals from said first and second comparators respectively and delivering a signal when there is coincidence between said first and second signals.

4,694,201

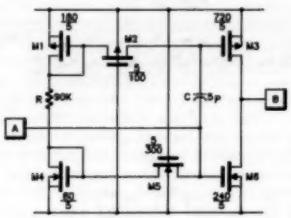
CURRENT-SAVING CMOS INPUT BUFFER

Barry L. Jason, Bedford, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 30, 1985, Ser. No. 728,715

Int. Cl.[4] H03K *19/092, 17/16;* **H03L** *5/00;* **H03F** *3/18*

U.S. Cl. 307—475 **5 Claims**



1. A current saving CMOS signal buffer comprising:

input means for receiving an input signal;

output means for providing an output signal;

at least two CMOS output transistors connected in a push-pull configuration between a supply voltage differential comprising a positive supply voltge and a negative supply voltage said CMOS output transistors having their gates connected in common to said input means and wherein a common output between said transistors connects to said output means;

means coupled to said two CMOS output transistors forming first and second current mirrors for providing a source of substantially constant current mirrored to said output transistors; and

such that current flows through said output transistors to increase substantially linearly as said supply voltage differential increases linearly.

4,694,202

BI-MOS BUFFER CIRCUIT

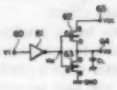
Masahiro Iwamura, and Ikuro Masuda, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

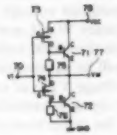
Filed Dec. 17, 1984, Ser. No. 682,197

Claims priority, application Japan, Dec. 16, 1983, 58-238519

Int. Cl.[4] H03K *19/092, 19/02, 19/20, 3/01*

U.S. Cl. 307—475 **24 Claims**





1. A buffer circuit having an output stage for driving a load and a driver stage for driving said outpout stage, comprising:

a first MOS transistor for constituting said output stage; and

a bipolar transistor-MOS transistor composite logic circuit for constituting said driver stage, having:

an output circuit including a bipolar transistor for driving said first MOS transistor, and

an input circuit including a second MOS transistor responsive to a predetermined input for rendering said bipolar transistor in the on or off state, wherein the effective channel size of said first MOS transistor is larger than that of said second MOS transistor,

wherein said first MOS transistor has a gate connected to the output of said driver stage, and a source-drain path connected between said load and a predetermined potential.

4,694,203

HIGH SPEED BI-COMOS SWITCHING CIRCUIT

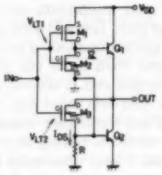
Akira Uragami, Takasaki; Yukio Suzuki, Hinode; Masahiro Iwamura, and Ikuro Masuda, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 26, 1985, Ser. No. 716,151

Claims priority, application Japan, Mar. 26, 1984, 59-56033

Int. Cl.[4] H03K *19/013, 19/017*

U.S. Cl. 307—446 **9 Claims**



1. A switching circuit comprising:

(1) first and second bipolar transistors having collector-emitter paths which are connected in series across a first operation potential point and a second operation potential point to provide an output signal for said switching circuit;

(2) a CMOS inverter circuit connected between an input terminal of said switching circuit and a base of the first bipolar transistor; and

(3) a source follower circuit connected between said input terminal and a base of said second bipolar transistor,

wherein:

said CMOS inverter circuit has a first MOSFET of the first type of conductivity and a second MOSFET of the second type of conductivity;

said source follower circuit has a third MOSFET of the second type of conductivity and resistance means;

said second MOSFET and said third MOSFET have a substantially equal logic threshold voltage V_{thNO} in the absence of substrate effect;

said resistance means has a predetermined resistance such that a turn-on and a turn-off time of said second bipolar transistor are shorter than a predetermined value;

said first MOSFET and said second MOSFET have predetermined logic threshold voltage V_{thPO}, V_{thNO} in the absence of substrate effect, and channel conductances W_P/L_P, W_N/L_N, such that said CMOS inverter will have a desired logic threshold voltage V_{LT1};

the channel conductance W_N/L_N of said third MOSFET is so set that the logic threshold voltage V_{LT2} of said source follower circuit will be substantially equal to said desired logic threshold voltage V_{LT1} of said CMOS inverter; and

wherein said output signal is provided at an output terminal coupled between the respective collector-emitter paths of said first and second bipolar transistors.

4,694,204

TRANSISTOR CIRCUIT FOR SIGNAL MULTIPLIER

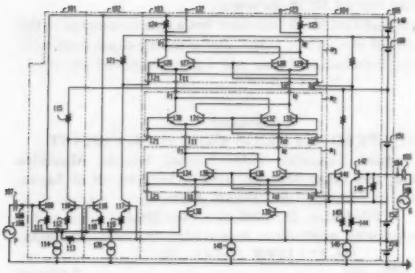
Kazunori Nishijima, and Mitsutoshi Sugawara, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 28, 1985, Ser. No. 706,597

Claims priority, application Japan, Feb. 29, 1984, 59-38010; Aug. 6, 1984, 59-164434

Int. Cl.[4] H03B *17/00;* **G06G** *7/16*

U.S. Cl. 307—494 **10 Claims**



1. A transistor circuit comprising first, second and third multipliers, each of said multipliers including first, second, third and fourth input ends, first and second output ends, a first transistor having an emitter connected to said first input end, a base connected to said third input end and a collector connected to said first output end, a second transistor having an emitter connected to said first input end, a base connected to said fourth input end and a collector connected to said second output end, a third transistor having an emitter connected to said second input end, a base connected to said fourth input end and a collector connected to said first output end, and a fourth transistor having an emitter connected to said second input end, a base connected to said third input end and a collector connected to said second output end, said first and second output ends of said first multiplier being connected respectively to said first and second input ends of said second multiplier, said first and second output ends of said second multiplier being connected respectively to said first and second input ends of said third multiplier, a first input terminal supplied with a first signal P, a second input terminal supplied with a second signal Q, an output terminal connected to said first output end of said third multiplier, first signal-supply means coupled to said first input terminal for supplying third and fourth signals each proportional to said first signal P to said first and second input ends of said first multiplier, respectively, a phase of said third signal being opposite to a phase of said fourth signal, second signal-supply means coupled to said first input terminal for supplying fifth and sixth signals each proportional to said first signal P to the third input ends of said second and third multipliers, respectively, a phase of said fifth signal being equal to a phase of said sixth signal, third signal-supply means coupled to said second input terminal for supplying a seventh signal proportional to said second signal Q to said third input end of said first multiplier, and fourth signal-supply means coupled to said second input terminal for supplying eighth and ninth signals each proportional to said second signal Q to the fourth input ends of said second and third multipliers, respectively, a phase of said eighth signal being opposite to a phase of said ninth signal, whereby an output signal having the value of $P \times Q \times (P+Q) \times (P-Q)$ is produced from said output terminal.

4,694,205

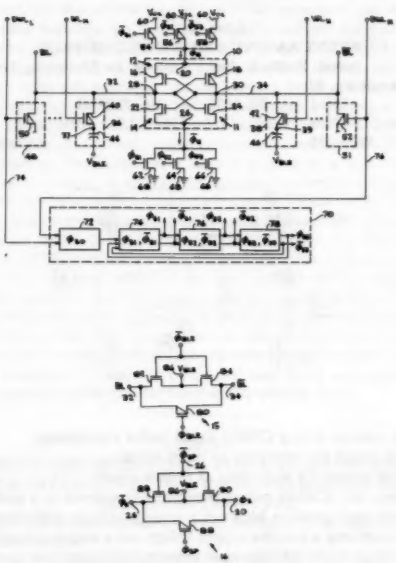
MIDPOINT SENSE AMPLIFICATION SCHEME FOR A CMOS DRAM

Lee-Lean Shu, Milpitas, and Tai-Ching Shyu, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 3, 1985, Ser. No. 740,356

Int. Cl.[4] H03K *17/04, 17/687, 3/356, 19/01*

U.S. Cl. 307—530 **17 Claims**



1. A system for controlling the amplification rate of the differential voltage signal developed at inputs of a CMOS sense amp of the type having a pull-up latch, with a first source node, and a pull-down latch, with a second source node, said system comprising:

means for determining when the amplitude of the differential voltage signal is equal to a first predetermined level;

means for establishing the amplification rate at a first selected value when the magnitude of the differential volt-

age signal is between the first and a second predetermined value to prevent signal loss; and

means for increasing the amplification rate to a second selected value when the amplitude of the differential signal voltage is above the second predetermined level to decrease the duration of the sense cycle.

4,694,206

DRIVE CIRCUIT FOR A POWER FIELD EFFECT TRANSISTOR

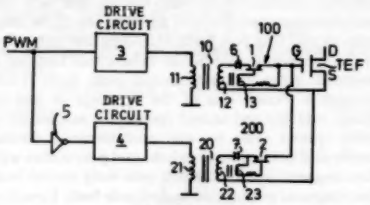
Alan H. Weinberg, Sassenheim, Netherlands, assignor to Agence Spatiale Europeenne, Paris, France

Filed Dec. 11, 1984, Ser. No. 680,952

Claims priority, application France, Dec. 14, 1983, 83 20726

Int. Cl.[4] H03K *17/04, 17/08, 17/687*

U.S. Cl. 307—571 **9 Claims**



1. A drive circuit for a power field effect transistor, comprising:

a first switching circuit connected between the gate and source electrodes of said field effect transistor, said first switching circuit including

a first pulse transformer having a primary winding and first and second secondary windings; and

a first transistor having its drain and source connected in series with the first secondary winding of said first pulse transformer, said series-connected first transistor and first secondary winding of said first pulse transformer being connected between the gate and source electrodes of said field effect transistor, the second secondary winding of said first pulse transformer being connected between the gate and source of said first transistor;

a second switching circuit connected between the gate and source electrodes of said field effect transistor, said second switching circuit including

a second pulse transformer having a primary winding and first and second secondary windings; and

a second transistor having its drain and source connected in series with the first secondary winding of said second pulse transformer, said series-connected second transistor and first secondary winding of said second pulse transformer being connected between the gate and source electrodes of said field effect transistor, the second secondary winding of said second pulse transformer being connected between the gate and source of said second transistor;

a first pulse generator coupled to the primary winding of said first pulse transformer, said first pulse generator, in response to an input signal, producing positive voltage pulses at a predetermined rate across the first and second secondary windings of said first pulse transformer, the voltage pulses across the second secondary winding of said first pulse transformer turning said first transistor ON and OFF, and the voltage pulses across the first secondary winding of said first pulse transformer charging the gate-source capacitance of said field effect transistor to the open circuit source voltage of said first pulse transformer thereby turning said field effect transistor ON; and

a second pulse generator coupled to the primary winding of said second pulse transformer, said second pulse generator, in response to said input signal, producing negative voltage pulses at a predetermined rate across the first and second secondary windings of said second pulse transformer, the voltage pulses across the second secondary winding of said second pulse transformer turning said second transistor OFF, and the voltage pulses across the first secondary winding of said second pulse transformer charging the gate-source capacitance of said field effect transistor to a negative voltage thereby turning said field effect transistor OFF.

4,694,207

FET GATING CIRCUIT FOR SWITCHING ELECTRICAL LOADS

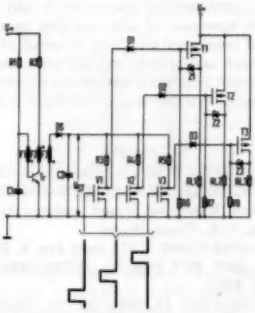
Erwin Heuwieser, Haar, and Kurt Schwaiger, Wolfratshausen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 473,869, Mar. 10, 1983, abandoned. This application Feb. 7, 1986, Ser. No. 827,653

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1982, 3209070

Int. Cl.[4] H03K *17/687, 17/56*

U.S. Cl. 307—571 **3 Claims**



1. Circuit arrangement for switching an electrical load, comprising an MOS switching transistor having its drain-source path connected between the positive terminal of a d-c voltage source and one side of the load, the other side of the load being connected to ground potential, said switching transistor having a gate to which a control voltage is applied which is at least equal to the sum of the voltage of said d-c voltage source and a voltage of a gate-source path of said switching transistor, an oscillator circuit for generating said control voltage by voltage transformation, said oscillator circuit being connected in parallel with said series connection of the load and said switching transistor between said positive and negative terminals of said d-c voltage source, and an input transistor for switching said switching transistor, said input transistor having a drain-source path connecting said gate of said switching transistor and said negative terminal of said d-c voltage source, said input transistor having a gate for receiving switching pulses.

4,694,208

CURRENT-IMPULSE CONVERTER CIRCUIT WITH VARIABLE TIME CONSTANT

Béla Szabó; Jeno Vágvölgyi, and István Fehér, all of Budapest, Hungary, assignors to MTA Kozponti Fizikai Kutato Intezete, Budapest, Hungary

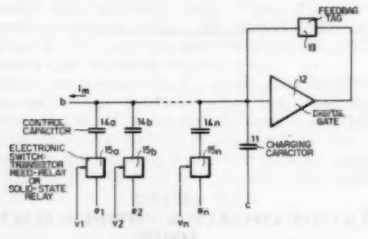
PCT No. PCT/HU84/00046, § 371 Date May 22, 1985, § 102(e) Date May 22, 1985, PCT Pub. No. WO85/01847, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 5, 1984, Ser. No. 760,724

Claims priority, application Hungary, Oct. 7, 1983, 3471-83

Int. Cl.[4] H03K *5/13*; G06G *7/18*; H03F *1/02*; H03M *1/00*

U.S. Cl. 307—603 **2 Claims**



1. A current-impulse converter, comprising: a digital gate for converting an input current to an output train of impulses, said gate having a limited switching speed; feedback means having an input connected to the output of said digital gate and an output connected to an input line of said digital gate; a charging capacitor having a first terminal connected to said input line of said digital gate and a second terminal connected to a stable voltage line; at least one control capacitor and at least one electronic switch; each said at least one control capacitor having a first terminal connected to said input line of said digital gate upstream of said charging capacitor, and a second terminal connected to a first terminal of a said electronic switch, each said at least one electronic switch further comprising a second terminal connected to a control input line and a third terminal connected to a stabilized voltage line.

4,694,209

MOVING ELEMENT BODY APPARATUS OF LINEAR MOTOR AND METHOD FOR PRODUCING IT

Norikazu Shindou, Kanagawa, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Chofu, Japan

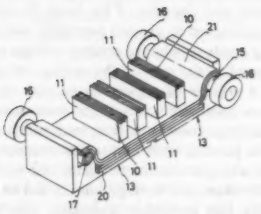
PCT No. PCT/JP84/00498, § 371 Date Jun. 6, 1985, § 102(e) Date Jun. 6, 1985, PCT Pub. No. WO85/01843, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 19, 1984, Ser. No. 743,024

Claims priority, application Japan, Oct. 19, 1983, 58-195419

Int. Cl.[4] H02K *41/00*

U.S. Cl. 310—12 **8 Claims**



1. A movable element for use in a linear electric motor, comprising:

a first pole body formed of a magnetizable material and having a base and a plurality of magnetic poles extending outwardly from said base, said magnetic poles being spaced apart by a predetermined distance and being magnetically interconnected by said base;

a second pole body formed of a magnetizable material and spaced from said first pole body, said second pole body having a base and a plurality of magnetic poles extending outwardly from said base, said magnetic poles of said second pole body being spaced apart by said predetermined distance and being magnetically interconnected by the base of said second pole body; and

holder means of a non-magnetic material for holding said first and second pole bodies in a spaced apart relationship with a first one of the magnetic poles of said first pole body spaced from a first one of the magnetic poles of the second pole body by said predetermined distance, said holder means including surface means for at least partially defining a plurality of openings spaced from each other by said predetermined distance, said first one of the magnetic poles of said first pole body extending through a first one of the openings in said holder means, said first one of the magnetic poles of said second pole body extending through a second one of the openings in said holder means, said first and second openings in said holder means being spaced apart by said predetermined distance to enable said holder means to hold said pole bodies with said first magnetic pole of said first pole body spaced from said first magnetic pole of said second pole body by said predetermined distance.

4,694,210

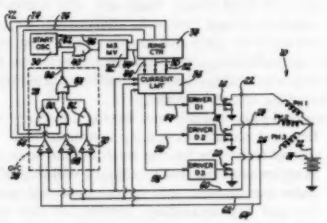
BRUSHLESS DC MOTOR AND SENSORLESS DRIVE ARRANGEMENT THEREFOR

James O. Elliott, Beavercreek, and Jack W. Savage, Centerville, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 31, 1986, Ser. No. 891,108

Int. Cl.[4] H02K *11/00*

U.S. Cl. 310—68 R **1 Claim**



1. A brushless motor and drive arrangement comprising in combination:

a rotary output member rigidly coupled to a driven load, a magnetic rotor assembly including a plurality of permanent magnets mounted on the periphery of an annular magnetic ring, a stator assembly including at least two stator windings disposed relative to said magnetic rotor assembly such that (1) energization of an individual winding thereof with electric current develops torque for imparting rotary motion to the magnetic rotor assembly, and (2) movement of the rotor assembly relative to the stator assembly induces a voltage in the stator windings, a sensorless controller including means for initiating movement of the rotor assembly by energizing a given one of the stator windings and monitoring the voltage, whereby induced in at least one other stator winding to obtain rotor position information therefrom for synchronizing subsequenty energization of the stator windings with the rotor position, and resilient means for coupling the annu-

lar magnetic ring to the rotary output member so that when the controller energizes a given stator winding to initiate movement of the magnetic rotor assembly, the magnetic rotor assembly is able to rotate relative to the rotary output member and load at an effective velocity which induces a greater voltage in the other stator windings than would otherwise occur, thereby enabling the controller to obtain reliable rotor information for successfully starting the motor and load even though the load has relatively high inertia.

4,694,211

SYSTEM FOR SUPPLYING FUEL INCLUDING PROTECTION AGAINST ELECTROLYTIC CORROSION

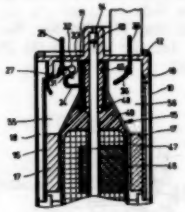
Heiner Bayha, Vaihingen; Hermann Kluge, Ingersheim, and Horst Rachner, Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to SWF Auto Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

Filed Jun. 3, 1986, Ser. No. 870,100

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1985, 3522835

Int. Cl.⁴ F04B *17/00*; H02K *11/00*

U.S. Cl. 310—71 **10 Claims**



1. A system for supplying a fuel in a motor vehicle including an electric motor driving a supply pump said motor and said pump mounted in a housing, comprising a metallic component part in said housing carrying a pair of permanent magnets, stationarily arranged metallic current leads adapted to be connected to an external electrical operating circuit, said metallic component part electrically connected to a positive side of the operating circuit of the electric motor, and means providing for a higher electric potential at said metallic component part than at one of said current leads connected to the positve side of said motor.

4,694,212

MAGNETIC PRELOADING OF ACTUATOR BEARINGS

Jean I. Montagu, Brookline, Mass., assignor to General Scanning, Inc., Watertown, Mass.

Filed Mar. 21, 1986, Ser. No. 842,623

Int. Cl.⁴ H02K *7/08*

U.S. Cl. 310—90 **13 Claims**

3. A limited rotation electromechanical actuator comprising

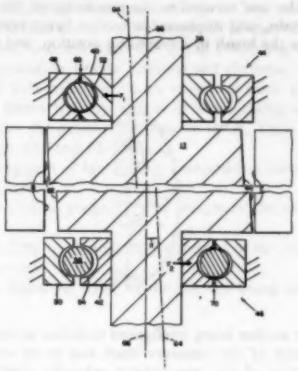
a stator assembly having a plurality of stator pole faces,

a rotor having a plurality of rotor pole faces,

two bearings for supporting said rotor for rotation about an axis relative to said stator assembly such that said rotor pole faces are juxtaposed opposite and spaced from said corresponding stator pole faces by gaps which extend along the length of said rotor, said bearings being characterized by radial free play,

means for establishing magnetic drive flux across said gaps to cause a rotational driving torque to act upon said rotor, and

means for establishing magnetic bias flux across said gaps, at least one said gap having a configuration such that said flux acting across said gap produces radial forces that act upon said rotor to reduce said radial free play in said bearings,



said gap having a varying size along its length but nowhere so great as to have effectively infinite reluctance.

4,694,213

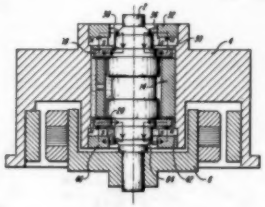
FERROFLUID SEAL FOR A STATIONARY SHAFT AND A ROTATING HUB

Hanumaiah L. Gowda, Hudson; Charles J. Cheever, Nashua, and Frank Bloom, Windham, all of N.H., assignors to Ferrofluidics Corporation, Nashua, N.H.

Filed Nov. 21, 1986, Ser. No. 933,485

Int. Cl.⁴ H02K *5/124*; H01F *7/02*; F16J *15/40*; F16C *32/04*

U.S. Cl. 310—90 **21 Claims**



1. In a bearing application having a stationary shaft about which a hub rotates, a ferrofluid seal for isolating said bearing from from an external environment, said seal comprising a magnet, means for forming a magnetic circuit including said magnet, said shaft and at least one annular gap between a portion of said magnetic circuit and said shaft, said gap being filled with ferrofluid, the improvement comprising,

a taper on said shaft forming a portion of said gap into a first annular wedge-shaped gap having a sloping wall which extends radially towards the axis of said shaft and in a direction towards said external environment.

4,694,214

BRUSH HOLDER FOR DYNAMOELECTRIC MACHINES

Kenneth W. Stewart, Sr., Columbus, Miss., assignor to United Technologies Electro Systems, Inc., Columbus, Miss.

Filed Mar. 7, 1986, Ser. No. 837,108

Int. Cl.⁴ H02K *13/00*

U.S. Cl. 310—239 **10 Claims**

1. A dynamoelectric machine of the type having brushes that contact a commutator positioned on an armature shaft of an armature which comprises:

a brush holder for positioning at least one brush to engage the commutator, said brush holder including an integral displaceable section defined by slots formed in the brush holder and secured to the remainder of the brush holder by tabs, said displaceable section being positioned to secure the brush in a mounting position, and said displaceable section being configured to define an opening for the receipt of the armature shaft and to be contacted by a portion of the commutator whereby contact with the commutator acts to displace the tabs securing the displaceable section and to displace the displaceable section thereby releasing the brush to engage the commutator.

4,694,215

COMPACT, SINGLE-ENDED FLUORESCENT LAMP WITH FILL VAPOR PRESSURE CONTROL

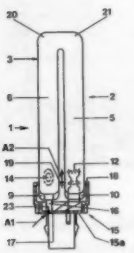
Dieter Hofmann, Augsburg, Fed. Rep. of Germany, assignor to Patent-Treuhand Gesellschaft fur elektrische Gluhlampen mbH, Munich, Fed. Rep. of Germany

Filed Sep. 3, 1985, Ser. No. 771,986

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1984, 3432675

Int. Cl.[4] H01J *61/52, 17/28*

U.S. Cl. 313—44 **14 Claims**



1. A compact, single-ended, low-pressure discharge lamp (**1, 24, 33, 43**) with vapor pressure control regardless of lamp position, having

a single base (**15, 27, 34, 44**);

an internally continuous discharge vessel (**2, 35**) in form of a plurality of tube legs (**5, 6, 7, 8**) located close to each other and being closed at opposite ends,

one end portion of the tube legs extending into the base and being subjected to heating,

said end portions of the tube legs in the base being closed by a pinch or press seal, and secured and retained within the interior of the base;

electrodes (**12, 13**) press-sealed into two of the end portions of the tube legs; and

a fill of mercury and a noble gas within the discharge vessel, wherein

a base cooling zone is provided, located within the base, said base cooling zone, in operation of the lamp, and upon positioning of the lamp in "base down" position, being located in the region of the end portions of the discharge vessel, subject to heating, located in the base and comprising

a cooling tube or stub (**16, 28, 36, 48**) pinch or press-sealed in the press seal of at least one of the legs, said cooling tube or stub being open to the interior of the discharge vessel, terminating essentially flush with the pinch or press seal at the inside of the discharge vessel, and being tipped off at a position beyond the pinch or press seal of the respective tube leg to form a projecting cooling tube; and the base has a base wall (**15***a*, **14***a*) formed with an air inlet opening (**17, 26, 39**) passing therethrough and further formed with an upper region defining an air outlet opening (**19, 42, 50**), said openings being located to provide for air flow through the base by thermal convection to place said projection cooling tube in a stream of air flow between said air flow openings when the lamp is in "base down" position.

4,694,216

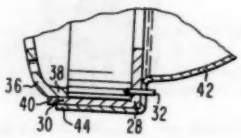
CATHODE-RAY TUBE HAVING AN INTERNAL MAGNETIC SHIELD

Albert M. Morrell, Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed May 27, 1986, Ser. No. 867,033

Int. Cl.[4] H01J *29/06, 29/07*

U.S. Cl. 313—402 **7 Claims**



1. In a cathode-ray tube having a faceplate panel joined to a funnel thereof along a sidewall of said panel, and having an internal magnetic shield disposed therein proximate an inner surface of said funnel and connected along one end thereof to a back portion of a shadow-mask frame oriented orthogonally to a central axis of said tube and supported adjacent said sidewall, a multi-apertured shadow mask being connected along an edge thereof to a front portion of said shadow-mask frame opposite the back portion, the improvement comprising the one end of said magnetic shield overlapping, along the direction of said central axis, the corresponding edge of said shadow mask around substantially all of said shadow-mask frame.

4,694,217

CATHODE RAY TUBE INCLUDING WHITE LUMINOUS PHOSPHOR SCREEN

Yasukazu Morita, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 21, 1985, Ser. No. 789,777

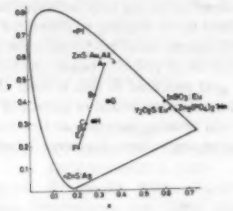
Claims priority, application Japan, Oct. 26, 1984, 59-223903

Int. Cl.[4] H01J *29/70;* **C09K** *1/14*

U.S. Cl. 313—468 **20 Claims**

1. A cathode ray tube including a phosphor screen, wherein the phosphor being composed of a white emitting mixed phosphor consisting essentially of (i) a first phosphor having the composition expressed by a composition formula $(M_{1-x}Tb_x)_2O_2S$, wherein m corresponds to at least one element selected from the group consisting of Y and Gd and the range of x is $0<x\leqq0.01$ (ii) a second phosphor being selected from a group of phosphors having the compositions expressed by composition formulas ZnS:AuAl and Zn_2SiO_4:Mn and of

phosphors having the compositions expressed by composition formulas Y_2O_2S:Eu, $InBO_3$:Eu and $Zn_3(PO_4)2$:Mn and (iii) at



least one other phosphor in addition to said first phosphor and said second selected phosphor included in the above group.

4,694,218

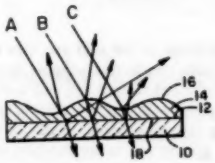
NON-GLAZE COATING FOR A CATHODE RAY TUBE

Paul Chao, Philadelphia, Pa., assignor to Cotek Company, Philadelphia, Pa.

Division of Ser. No. 607,270, May 4, 1984, Pat. No. 4,596,745. This application Jan. 13, 1986, Ser. No. 817,867

Int. Cl.[4] H01J *29/88*

U.S. Cl. 313—478 **5 Claims**



1. In a cathode ray tube having an optical glass screen, the improvement wherein said optical glass screen is coated exteriorly with a mixture of a solid of partially hydrolized metal alkoxides, the metal alkoxides having the general formula $M(OR)_4$ where M is selected form the group consisting of silicon, titanium and zirconium, wherein the metal alkoxides comprise SiO_2 and ZrO_2 and wherein the SiO_2 forms approximately 85% of the solid mixture by weight.

4,694,219

DISCHARGE LAMP ARC TUBES

Peter Hing, Birstall, England, assignor to Thorn EMI plc, London, England

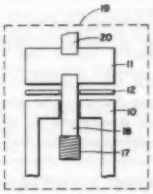
Continuation of Ser. No. 690,408, Jan. 10, 1985, Pat. No. 4,585,972, which is a continuation of Ser. No. 332,216, Dec. 18, 1981, abandoned. This application Jan. 8, 1986, Ser. No. 817,057

Claims priority, application United Kingdom, Dec. 20, 1980, 8040906

The portion of the term of this patent subsequent to Apr. 29, 2003, has been disclaimed.

Int. Cl.[4] H01J *61/22, 61/30, 61/36;* C03C *8/24*

U.S. Cl. 313—636 **4 Claims**



1. An arc tube for a metal halide discharge lamp, said arc tube comprising an envelope of polycrystalline alumina, sapphire or a spinel, and one or more cermet end closures hermetically sealed thereto by a sealing composition, said sealing composition consisting of at least one of:

(I) about 2.00% to about 5% by weight of at least one nucleating agent selected from the group consisting of phosphorus pentoxide, titania, zirconia and chromia;

(II) about 1.96% to about 5% by weight of boric oxide;

(III) up to about 10% by weight of a nucleating agent selected from the group consisting of HfO_2, Y_2O_3, Yb_2O_3, La_2O_3, Dy_2O_3, and Eu_2O_3; and

the remaining part of said sealing composition consisting of a mixture of

from about 13% to about 21% by weight of the mixture of alumina;

from about 25% to about 28% by weight of the mixture of magnesia; and

the balance based on 100% of the mixture being silica.

4,694,220

HIGH-SPEED FRAME PICK-UP CAMERA

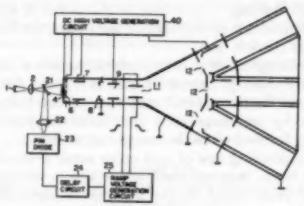
Katsuyuki Kinoshita, Hamamatsu, Japan, assignor to Hamamatsu Photonics Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 16, 1985, Ser. No. 723,642

Claims priority, application Japan, Apr. 20, 1984, 59-79794

Int. Cl.[4] H01J *31/26;* H04N *9/20*

U.S. Cl. 315—10 **9 Claims**



1. A high-speed frame pick-up camera for picking up the frames of a photoelectronic image formed on the photoelectric layer of an imaging tube comprising:

a first electron lens for reforming said photoelectronic image;

deflection means arranged so that the re-formed image of said photoelectronic image is located at the deflection center thereof;

a plurality of second electron lenses each having a central axis arranged to correspond with said deflection center so that the electron beam deflected by said deflection means is successively received thereby, a plurality of image frames being formed by said second electron means;

a plurality of phosphor layers respectively arranged in the locations of said image frames;

a lens drive circuit for supplying power to said first and second electron lenses; and

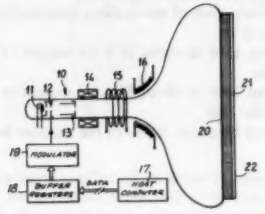
a deflection means drive circuit for supplying power to said deflection means.

4,694,221

DEVICE FOR THE RESTITUTION AND/OR ANALYZING OF COLOR IMAGES USING LINE-TYPE FIBER OPTICS CATHODE RAY TUBE

Jean-Claude Rosier, Gasny, France, assignor to Societe Europeenne de Propulsion, France

Filed Jul. 17, 1986, Ser. No. 886,385
Claims priority, application France, Jul. 23, 1985, 85 11258
Int. Cl.[4] H04N *9/24*
U.S. Cl. 315—10 **14 Claims**



1. Device for the restitution of a color image on an image carrier, comprising:

a cathode ray tube provided with a line screen;

an assembly of optical fibers fixed on the front face of said cathode tube line screen;

a color mask in film form, fixed in front of said assembly of optical fibers and provided with at least three lines of different colors;

means for scanning said line screen by the electron beam of said tube along different lines corresponding to the lines of said color mask;

means for modulating the electron beam of said tube as a function of an image singal which corresponds to the image to be restituted and which is produced from data representing a color component of a line of image;

buffer registers receiving data representing the color components of the lines of image and coupled to said modulation means, said buffer registers being so arranged as to enable sequential reading of the data in the order in which the color components of the lines of the image are formed on the image carrier; and

means providing relative displacement between said color mask and the image carrier situated in front of the mask so as to form on the carrier each line of the image to be restituted by superimposition of its color components each one being formed when the image carrier passes in front of the corresponding line of said color mask scanned by the electron beam, wherein each image line is scanned a plurality of times equal to the number of different colors provided on said color mask, each scan utilizing a unique set of data not necessarily equal to the set of data used for preceding or subsequent scans.

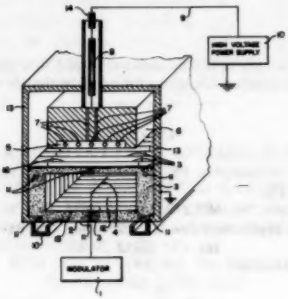
4,694,222

ION PLASMA ELECTRON GUN

George Wakalopulos, Pacific Palisades, Calif., assignor to RPC Industries, Hayward, Calif.

Filed Apr. 2, 1984, Ser. No. 596,093
Int. Cl.[4] H02K *39/00*
U.S. Cl. 315—111.21 **3 Claims**

1. An ion plasma electron gun assembly comprising: an electrically conductive evacuated housing forming first and second chambers adjacent to one another and having an opening therebetween; means for generating positive ions in said first chamber; a cathode positioned in said second chamber in spaced and insulated relationship from said housing, said cathode having a secondary electron emissive surface; means for applying a high negative voltage between said cathode and said housing to cause said cathode to draw the positive ions from said first chamber to said second chamber to impinge on said surface of said cathode and to cause said surface to emit secondary electrons; an electrically conductive electron transmissive foil extending over an opening in said housing at the end of said first chamber facing said cathode, said foil being electrically connected to the housing to constitute an anode for the secondary electrons and causing the secondary electrons to pass through the foil as an electron beam; an electrically conductive extractor grid mounted in said second chamber adjacent to the secondary electron emissive surface of said cathode and connected to said housing to create an electrostatic field at said surface to cause secondary electrons therefrom to pass



through the openings in the grid and into said first chamber; and an electrically conductive support grid mounted in said first chamber adjacent to said foil and connected to said foil and to said housing, said support grid serving to support said foil and having openings therein aligned with the openings in said extractor grid to act in conjunction with said extractor grid to accelerate the secondary electrons to the foil,

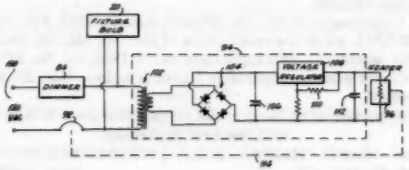
wherein said secondary electron emissive surface of said cathode has grooves formed therein at predetermined angles to increase electron emission and to direct electrons through the openings in said extraction grid.

4,694,223

THERMAL SENSOR FOR A LIGHTING FIXTURE

Steve Campolo, Valley Stream, N.Y., assignor to Leviton Manufacturing Company, Inc., Little Neck, N.Y.

Filed Mar. 31, 1986, Ser. No. 846,394
Int. Cl.[4] H01J *7/24*
U.S. Cl. 315—118 **16 Claims**



1. Apparatus for protecting against overheating of a lamp fixture energized from a dimmer controlled voltage source, comprising:

a heat flow detector for attachment at a location in the vicinity of the lamp fixture to be subject to the same heat flow environment conditions as the lamp fixture, and comprising a temperature sensitive switch electrically coupled to said lamp fixture disconnecting the lamp fixture from the dimmer controlled voltage source in response to a predetermined temperature, a biasing heater energized from said dimmer controlled voltage source and

thermally coupled to the temperature sensitive switch for raising the temperature of the switch to said predetermined temperature when overheating of the lamp fixture prevents adequate dissipation into the environment of the heat from the biasing heater, and a regulator circuit for maintaining a required voltage across said biasing heater even upon reduction of the energization voltage from said dimmer controlled voltage source.

4,694,224

LIGHTING APPARATUS FOR AN ELECTRIC DISCHARGE LAMP

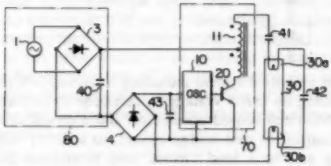
Hisato Nakagawa, Ryugasaki; Hideo Kuwahara, Funabashi; Atsuo Koyama, Nagareyama, and Mitsuo Akatsuka, Chiba, all of Japan, assignors to Hitachi Lighting, Ltd., Tokyo, Japan

Filed Oct. 19, 1984, Ser. No. 662,944

Claims priority, application Japan, Oct. 19, 1983, 58-194226

Int. Cl.[4] H05B *37/02*

U.S. Cl. 315—177 **20 Claims**



1. A lighting apparatus for an electric discharge lamp comprising:

a lighting ballast element, connected in series to an electrice discharge lamp having a pair of preheating electrodes, for stabilizing a lighting current to said discharge lamp;

a preheating ballast element, connected in series with said pair of preheating electrodes of said discharge lamp, for supplying a preheating electrice power to the discharge lamp;

electric power supply means for supplying an electric power to said lighting ballast element;

a control power supply circuit connected to obtain a control electric signal from said electric power supply means through the series circuit of said lighting ballast element and discharge lamp after the lamp has been lighted or through the series circuit of said lighting ballast element, said preheating ballast element and the two preheating electrodes of said discharge lamp when said electric power is supplied to said lighting ballast element to light said lamp; and

an oscillator connected to receive said control electric signal from said control power supply circuit for controlling said electric power supply means to supply electric power to said lighting ballast element only while it receives said control electric signal from said control power supply circuit.

4,694,225

METHOD OF DRIVING A FLAT TYPE OF CATHODE RAY TUBE TO PROVIDE UNIFORMITY OF ELECTRON BEAM EMISSION CHARACTERISTICS FOR A PLURALITY OF BEAM SOURCES

Kaoru Tomii, Isehara, and Kiyoshi Hamada, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Sep. 30, 1986, Ser. No. 913,593

Claims priority, application Japan, Sep. 30, 1985, 60-217060

Int. Cl.[4] H07J *29/70*

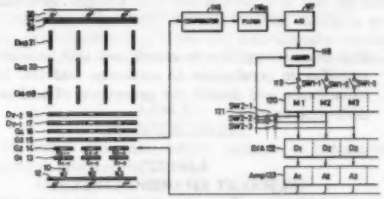
U.S. Cl. 315—366 **13 Claims**

1. A method of driving a flat type of cathode ray tube having a plurality of electron beam sources for producing respective electron beams, each of said electron beam sources comprising a cathode, a first group of electrodes comprising at least a first electrode for regulating a level of current of the corresponding electron beam and a second electrode disposed outward of said first electrode along the path of said electron beam for generating an electric field to produce said electron beam, and a second group of electrodes disposed outward of said first group of electrodes along said electron beam path, and respectively coupled to receive predetermined values of high voltage for focusing and deflecting said electron beam, the method comprising:

changing the voltage applied to one of said second group of electrodes to a fixed value which is substantially lower than said high voltage value;

successively deriving correction voltage values for each of said electron beams sources by:

enabling emission of an electron beam from said electron beam source by applying a fixed control voltage to said first electrode during a first time interval of fixed duration;



during said first time interval, sensing a current which flows from said electron beam passing into one of said second group of electrodes, and comparing the level of said sensed current with a fixed reference current value to obtain a first current difference value;

storing said first current difference value in a memory, and;

following completion of said first time interval, reading out said stored current difference value from said memory and deriving a first value of said correction voltage based on said current difference value, and;

applying said correction voltage such as to modify a potential difference between said cathode and said first group of electrodes in a direction tending to reduce the difference between said sensed current value and said reference current value, and restoring said voltage applied to said one of the second group of electrodes from said low to said high voltage level.

4,694,226

VERTICAL DEFLECTION CIRCUIT WITH SERVICE MODE OPERATION

James A. Wilber, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 29, 1986, Ser. No. 901,614

Int. Cl.[4] H01J *29/70*; H04N *17/02*

U.S. Cl. 315—408 **11 Claims**

1. A vertical deflection circuit for a video display apparatus having a service mode of operation, comprising:

a vertical deflection winding;

a DC blocking capacitance coupled to said deflection winding;

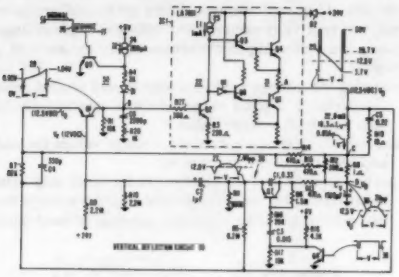
an output stage including first and second output amplifiers coupled to said vertical deflection winding in a push-pull arrangement at an output terminal, said first and second output amplifiers being respectively coupled to a source of supply voltage and to a reference potential point;

a driver stage coupled to said output stage;

a vertical sawtooth voltage generator coupled to said driver stage for applying a vertical sawtooth voltage thereto to drive said output stage at a vertical rate in a sawtooth manner to generate a sawtooth vertical deflection current in said deflection winding and establish a DC operating

voltage level at said output terminal that charges said DC blocking capacitance; and

service mode means coupled to said driver stage for asserting said service mode of operation by maintaining said



first output amplifier in cutoff and said second output amplifier in conduction to discharge said DC blocking capacitance and disable the generation of said sawtooth deflection current.

4,694,227

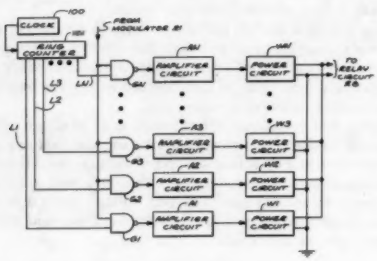
CURRENT SHARING CIRCUIT

Herbert M. Doman, Camarillo, Calif., assignor to Everest & Jennings, Inc., Camarillo, Calif.

Filed Apr. 14, 1986, Ser. No. 851,230

Int. Cl.[4] H03K *17/56*

U.S. Cl. 318—80 **11 Claims**



1. A controller circuit, comprising:

a source of potential;

a load;

a first power transistor having a collector-emitter circuit and including a collector, an emitter and a base;

a second power transistor having a collector, an emitter, and a base,

said source, said load and said collector-emitter circuit all being connected in series,

said second transistor collector and emitter being connected to said first transistor collector and emitter respectively: and

synchronous means connected to said transistor bases for gating said first transistor on while maintaining said second transistor at cut-off and vice versa.

6. A controller circuit, comprising:

a source of potential;

a load;

first, second . . . Nth power circuits having their outputs connected in parallel,

said power circuit outputs being connected in series with said source and said load; and

synchronous means to apply a gating pulse to each of said power circuits in digital succession,

all of said gating pulses occurring over mutually exclusive periods of time.

4,694,228

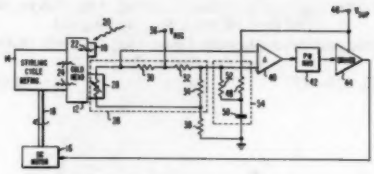
COMPENSATION CIRCUIT FOR CONTROL SYSTEM PROVIDING PULSE WIDTH MODULATED DRIVE SIGNAL

Theodore D. Michaelis, Burlington County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 21, 1986, Ser. No. 842,652

Int. Cl.[4] F25B *1/00*; **H02P** *5/26*

U.S. Cl. 318—341 **14 Claims**



1. In a control system including a sensing bridge circuit for producing an error voltage in response to deviations from a predetermined sensed parameter, and a modulator-driver circuit coupled to said bridge circuit, to a direct voltage power supply and to a load circuit, said modulator-driver circuit providing pulses of the voltage of said power supply to said load circuit, said modulator-driver circuit being responsive to said bridge circuit error voltage for establishing the width of said pulses, said load circuit being responsive to an average voltage level applied thereto, said average voltage level being the product of the voltage of said direct-voltage power supply multiplied by the pulse duty cycle, an apparatus for compensating for variations in said average voltage level due to variations in said power supply voltage, said apparatus comprising:

providing means coupled to said sensing bridge circuit and to said power supply for providing a signal responsive to said voltage of said direct voltage power supply, said signal affecting the balance of said sensing bridge circuit such that a change in said power supply voltage effects a change in the width of said driver circuit pulses.

4,694,229

SERVO POSITIONING SYSTEM

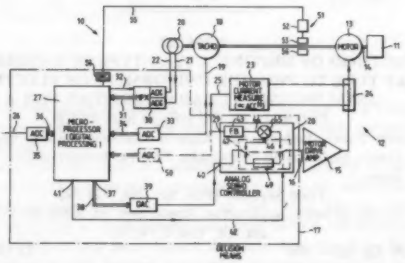
Robert J. Cormack, Edinburgh, Scotland, assignor to Ferranti, plc, Cheshire, England

Filed Nov. 8, 1985, Ser. No. 796,217

Claims priority, application United Kingdom, Nov. 9, 1984, 8428414

Int. Cl.[4] G05B *13/00*

U.S. Cl. 318—561 **13 Claims**



1. A feedback servo positioning system for controlling the position of a displaceable body in accordance with received

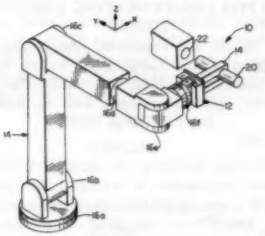
position demand signals representing the instantaneous position, velocity and acceleration of the body, drive motor means for displacing the body by current flow therein resulting from servo error signals and decision making means operable to provide said servo error signals to the drive motor in response to said position demand and transducer signals, said decision making means being responsive to a measured displacement between instantaneous and demanded positions less than a predetermined threshold value to configure the feedback servo system as a position feedback loop and derive servo error signals having values proportional to the difference between the instantaneous and demanded positions, and responsive to a displacement between instantaneous and demanded positions greater than said predetermined threshold value to configure the feedback servo system as an acceleration feedback loop, provide an acceleration demand signal representing the achievement of a predetermined acceleration by the drive motor means, determine an intermediate position as a present function of the demanded displacement, determine an acceleration error between the acceleration demand signal and transducer signal representing the instantaneous acceleration, cause the acceleration error signal to apply a drive current to the drive motor to accelerate it at said predetermined acceleration rate until it reaches the intermediate position thereafter causing the current in the drive motor to be reversed in direction to effect controlled deceleration of the drive motor and reduce the acceleration demand signal as a function of the instantaneous velocity and displacement to bring the body to rest at the demanded position.

4,694,230

MICROMANIPULATOR SYSTEM

Alexander H. Slocum, McLean, Va., and James P. Peris, Germantown, Md., assignors to USA as represented by the Secretary of Commerce, Washington, D.C.

Filed Mar. 11, 1986, Ser. No. 838,748
Int. Cl.[4] G05B *19/10*
U.S. Cl. 318—568 **8 Claims**



1. A micromanipulator system for precisely positioning an object in an xz plane and then for grossly moving the object in a y direction perpendicular to the xz plane comprising:

a base, said base defining a x axis, a y axis and a z axis;

a platform;

a mounting means for mounting said platform to said base for five different degrees of movement, the five degrees of movement being movement in the x direction, movement in the y direction, movement in the z direction, rotation about the x axis, and rotation about the z axis;

moving means for reversibly moving said platform in the five degrees of movement relative to said base, said moving means including a x position moving means for precisely positioning said platform a small distance in the x direction, a z position moving means for precisely positioning said platform a small distance in the z direction, and a y position moving means for coarsely positioning said platform a large distance in the y direction, said x position moving means and said z position moving means being linear actuators which serve as axles means about which said platform rotates about the x axis and the z axis respectively;

said base including a fixed plate and said z position moving means including a z plate such that said z position moving means pushes against said fixed plate in the z direction and said x position moving means pushes against said z plate and hence against said fixed plate in the x direction;

a rolling friction element means for providing a respective interface between a respective said actuator and one of a respective said fixed plate and said z plate, each said rolling friction element means including a concavity in the end of a respective said linear actuator, a ball located in said concavity, and a rounded trough in said fixed plate in which said ball is located such that movement along a respective x and z axis occurs as said ball rolls along the length of said trough, and movement about a respective x and z axis occurs as said ball rides up and down the sides of said rounded trough and concavity; and

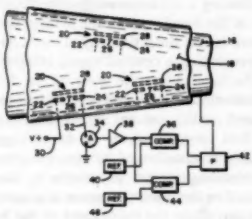
a means for holding the object, said holding means being attached to said platform and moved with said platform whereby the object held by said holding means is precisely positioned in a xz plane and subsequently coarsely moved in the y direction perpendicular to the xz plane.

4,694,231

ROBOTIC SKIN

Joseph G. Alvite', Wyoming, Minn., assignor to Mecanotron Corporation, Minneapolis, Minn.

Filed Apr. 18, 1986, Ser. No. 853,637
Int. Cl.[4] G01L *1/16*; G05D *15/00*; H01C *10/10*
U.S. Cl. 318—568 **8 Claims**



1. A tactile sensing skin for a movable member including:

a first flexible dielectric film forming a first insulative layer mounted with respect to the outside surface of a movable member, and having a first surface facing outwardly away from said member;

a second flexible and dielectric film forming a second insulative layer adjacent said first insulative layer, and having a second surface facing said first surface;

a carbon base electrically conductive compound substantially uniformly applied to one of said first and second surfaces;

an electrically conductive metallic compound selectively applied to the other of said surfaces, whereby said metallic compound and carbon base conductive compounds are contiguous over the interface between said first and second films, said metallic compound being selectively applied to form a plurality of discrete pairs of first and second electrically conductive regions and a dielectric gap between said conductive regions of each pair;

a means for establishing a substantially constant potential difference between the first conductive region and second conductive region in each pair;

a first matting of resilient fiber forming a first flexible layer attached to the outwardly facing surface of said second film;

an elastically deformable outer layer attached to the outwardly facing surface of said first flexible layer; and

a control means responsive to changes in the amount of

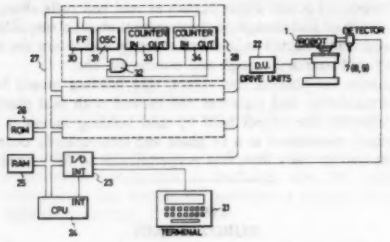
electrical current flowing between said first and second electrically conductive regions, for controlling travel of said member.

4,694,232

ROBOT CONTROLLING SYSTEM

Hayao Suzuki, and Yoshiharu Matsuoka, both of Koto, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Jul. 16, 1985, Ser. No. 755,615
Int. Cl.[4] G05B *19/42*
U.S. Cl. 318—568 **12 Claims**



1. In a robot controlling system having a robot hand which moves through a moving distance relative to articles stored in succession and is sequentially operated by a drive unit in response to operation data, the improvement comprising: detecting means for detecting the distance between the hand and the article and producing a corresponding detection signal during the movement of the hand toward the article; first controlling means responsive to the detection signal and connected to the drive unit for producing a control signal effective to stop the movement of the hand when the level of the detection signal reaches a predetermined level and for producing present self-taught data based on the control signal; memory means connected to the first controlling means for storing the present self-taught data representative of the stop position of the hand; and second controlling means responsive to the present self-taught data stored in the memory means and connected to the drive unit for controlling the movement of the hand based on the operation data and for calculating updated operation data representative of the next moving distance of the hand based on the present self-taught data so as to effect the movement of the hand at a higher speed toward the article through the next moving distance and thereafter effect the movement of the hand at a lower speed until the hand stops in response to the control signal produced by the first controlling means.

4,694,233

NUMERICAL CONTROL APPARATUS FOR MACHINE

Takao Yoneda, Nagoya, and Hiroshi Nakano, Toyoda, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 2, 1986, Ser. No. 902,659
Claims priority, application Japan, Aug. 31, 1985, 60-192991
Int. Cl.[4] G05B *19/18*
U.S. Cl. 318—569 **9 Claims**

1. A numerical control apparatus for controlling a machine which has a movable element and a servomotor for moving said movable element, said numerical control apparatus comprising:

memory means for storing numerical data representing numerical characteristics of movement of said movable element, said numerical data being expressable in either one of a first system of measurement and a second system of measurement;

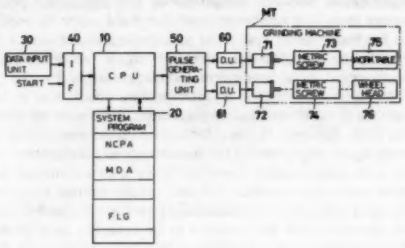
code means stored in said memory means for said numerical data expressed in said first system of measurement;

means for ascertaining when said code means is stored;

means for setting said numerical control apparatus to be operable for data expressed in one of said first system of measurement and in said second system of measurement;

means for ascertaining for which system of measurement said numerical control apparatus is set to be operable;

means responsive to said code ascertaining means and said system ascertaining means for converting said numerical data expressed in said second system of measurement into numerical data expressed in said first system of measurement when said numerical control apparatus is set to be



operable for data expressed in said second system of measurement; and

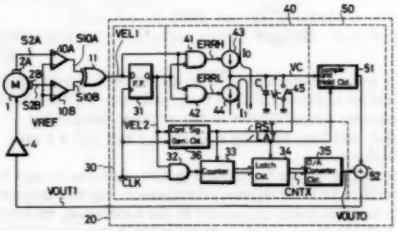
means for exciting said servomotor in accordance with said numerical data stored in said memory means when said code ascertaining means ascertains the presence of said code means, and in accordance with said numerical data converted by said converting means when said code ascertaining means ascertains the absence of said code means and said numerical control apparatus is set to be operable for data expressed in said second system of measurement.

4,694,234

APPARATUS FOR COMPENSATING A QUANTIZATION ERROR

Yasuo Nagai, Tokyo, and Fumiyoshi Abe, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 11, 1985, Ser. No. 807,740
Claims priority, application Japan, Dec. 25, 1984, 59-279428
Int. Cl.[4] G05B *19/29*
U.S. Cl. 318—603 **11 Claims**



1. An apparatus for detecting a pulse width of a pulse signal comprising:

means for generating reference clock pulses;

means for counting a number of said reference clock pulses occurring during said pulse signal and providing a count value indicating a pulse width of said pulse signal;

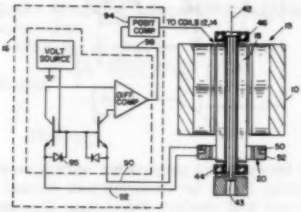
means for detecting a phase difference between said reference clock pulses and said pulse signal and including analogue means for generating an analogue signal corresponding to said phase difference; and

means for compensating said count value in response to said analogue signal to thereby generate pulse width data having a reduced quantization error.

4,694,235
CAPACITIVE POSITION SENSOR

Peter T. Flowers, Dorchester, Mass., assignor to General Scanning, Inc., Watertown, Mass.

Filed Aug. 1, 1986, Ser. No. 893,095
Int. Cl.[4] G05B *1/06*
U.S. Cl. 318—662 **10 Claims**



1. A capacitive sensor for sensing changes in the position of a rotating element relative to a stationary element, comprising

a capacitive surface on said rotating element,

two sets of capacitive surfaces that are fixed relative to said stationary element,

said rotating surface being arranged to cooperate both with one said fixed surface of one said set, and with one said fixed surface of the other said set such that as the area of overlap of said rotating surface with said one fixed surface increases, the area of overlap with said other fixed surface decreases, and vice versa,

said surfaces of one said set forming a first integral unit,

said surfaces of the other said set forming a second integral unit,

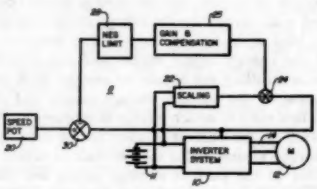
said two units each defining spaces to receive the surfaces of the other said unit,

said two units being held together with the surfaces of each said set resting in the corresponding spaces in the other said unit such that all of said surfaces of both said sets intersect a common plane, and the surfaces of said one set are electrically isolated from the surfaces of said other set.

4,694,236
CONTROL FOR AC MOTOR DRIVE

Anand Upadhyay, and Lawrence W. Messenger, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 26, 1985, Ser. No. 705,665
Int. Cl.[4] H02P *5/40*
U.S. Cl. 318—798 **9 Claims**



1. In a variable-speed AC motor drive having a variable output frequency inverter operated by a pulse width modulation (PWM) control to convert DC power developed by a battery into AC output power for energizing a motor, the battery having a finite power reserve and developing a progressively diminishing output voltage as the battery discharges, the inverter output frequency being determined in accordance with an input speed command signal, a control to maintain continued energization of the AC motor by the inverter at a constant inverter output voltage to output frequency ratio as the output voltage of the battery progressively diminishes, the control comprising:

means for deriving from the battery a signal representing the maximum motor speed which can be supported by the battery output voltage;

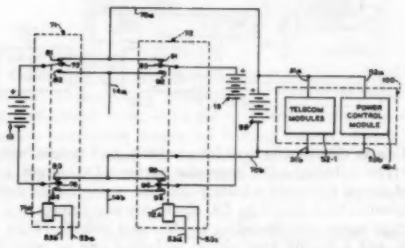
means for summing said maximum motor speed signal with said speed command signal to derive an error signal; and

means for summing an error signal indicating a maximum supportable motor speed less than the commanded speed with the speed command signal to reduce the speed command signal to the inverter.

4,694,237
ISOLATED POWER SUPPLY SYSTEM AND METHOD

George E. Hanson, Cedar Rapids, Iowa, assignor to Norand Corporation, Cedar Rapids, Iowa

Filed Jul. 8, 1986, Ser. No. 883,062
Int. Cl.[4] H02J *7/00, 9/00*
U.S. Cl. 320—6 **23 Claims**



1. In a system to be operated from an alternating current power line while providing isolation from electromagnetic interference coupled with the power line,

battery charging means having charger input means for coupling with an alternating current power line and having charger output means for supplying battery charging current,

first and second rechargeable battery means for selectively supplying electric power to a utilization circuit,

radio-frequency-isolating switching means controlling connection of said charger output means with said first and second rechargeable battery means and having a first switching condition for electrically isolating said first rechargeable battery means from the charger output means during connection of the first rechargeable battery means with the utilization circuit so as to block transmission of electromagnetic interference from the alternating current power line to the first rechargeable battery means and thus to the utilization circuit via the battery charging means, while providing for supply of battery charging current from the battery charging means to the second rechargeable battery means; and having a second switching condition for electrically isolating said second rechargeable battery means from the charger output means during connection of the second rechargeable battery means with the utilization circuit so as to block transmission of electromagnetic interference from the alternating current power line to the second rechargeable battery means and thus to the utilization circuit via said battery charging means, while providing for supply of charging current from the battery charging means to the first rechargeable battery means, and

control circuit means controlling switchover of said switching means between said first and second switching condition and comprising charge storage means for maintaining

the supply of power to the utilization circuit during switchover between the first and second switching conditions,

said charge storage means comprising a third rechargeable battery means connected with the utilization circuit and selectively connectable with the first and second rechargeable battery means under the control of said radio-frequency-isolating switching means.

4,694,238

DUAL VOLTAGE POWER SUPPLY SYSTEM FOR VEHICLES

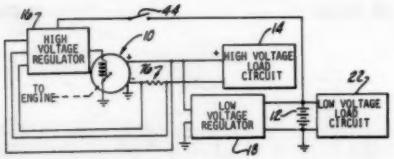
Peter Norton, 4787 Woodworth, Dearborn, Mich. 48126

Continuation of Ser. No. 569,723, Jan. 10, 1984, Pat. No. 4,604,528. This application Mar. 24, 1986, Ser. No. 843,108

The portion of the term of this patent subsequent to Aug. 5, 2003, has been disclaimed.

Int. Cl.[4] H02J *7/14;* **H02P** *9/30*

U.S. Cl. 322—28 **21 Claims**



1. In an electrical system for a vehicle, said system being of the type including a DC generator having a DC output, a first load circuit including a battery and one or more load devices adapted to be powered by DC electricity at a voltage in a first voltage range corresponding to the rated voltage of the battery, and a second load circuit including one or more load devices designed to be powered by a DC electricity at a voltage in a second voltage range extending substantially higher than said first voltage range, the improvement comprising:

a first regulator having an input coupled with a DC output of said DC generator and having an output coupled with said first load circuit, said first regulator including means for converting power received at said input to power at a voltage in said first voltage range,

and a second regulator for controlling said generator to produce a DC voltage meeting the requirements of said second load circuit, an output of said DC generator being coupled with said second load circuit.

4,694,239

ELECTRONIC VOLTAGE REGULATING DEVICE WITH COMPENSATION FOR THERMAL DISSIPATION, PARTICULARLY FOR ALTERNATORS

Fabio Marchio', Busto Arsizio, and Pietro Menniti, Milan, both of Italy, assignors to SGS Microelettronica S.p.A., Catania

Filed Mar. 10, 1986, Ser. No. 837,892

Claims priority, application Italy, Mar. 13, 1985, 19869 A/85

Int. Cl.[4] G05F *1/56*

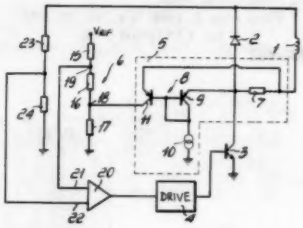
U.S. Cl. 323—285 **5 Claims**

1. An integrated electronic device for regulating the voltage of a load, in particular an alternator, with compensation of internal heat dissipation, comprising a control stage and a power stage,

said control stage comprising a control input connectable to the load for receiving therefrom a load voltage signal, temperature sensing means for generating an ambient temperature dependent reference voltage signal, comparing means connected to said control input and said sensing means for generating an output control signal,

said power stage having a power stage input receiving said output control signal and a power stage output connectable to said load, said power stage generating a drive signal to be supplied to said load and having an internal thermal dissipation,

said power stage including dissipation sensing means for detecting said drive signal and generating a thermal dissipation signal correlated thereto, and said control stage further including dissipation compensating means interposed between said temperature sensing means and said comparing means for receiving said thermal dissipation signal and said ambient temperature dependent voltage signal and for generating a compensated, ambient temperature dependent control signal fed to said comparing means.



4,694,240

SWITCHING REGULATOR

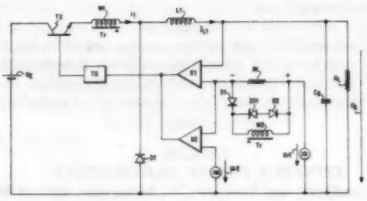
Eckhardt Grünsch, Allmersbach i.Tal, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Jun. 19, 1986, Ser. No. 875,954

Claims priority, application European Pat. Off., Jun. 20, 1985, 85 107614.1

Int. Cl.[4] G05F *1/56*

U.S. Cl. 323—285 **5 Claims**



1. In a switching regulator for controlling the delivery of current to a load in order to establish a selected voltage across the load, which regulator includes energy supply means constituting a source of current, current storage means connected to be supplied with current by the energy supply means for supplying the load with current, controllable switch means connected to the energy supply means and the current storage means for controlling the supply of energy from the energy supply means to the current storage means and switchable between a first state in which energy is supplied by the energy supply means to the current storage means for charging the current storage means, and a second state in which energy is not supplied to the current storage means and the current storage means discharges, and regulating means connected to the switch means for switching the switch means between the first and second states in cycles, with each cycle being composed of a first period during which the switch means are in the first switching state and a second period during which the switch means are in the second switching state, the improvement wherein said regulating means comprise means for monitoring the peak current supplied by the energy supply means

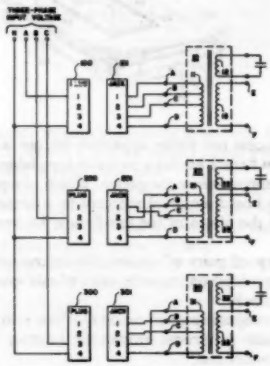
during each first period and for controlling the peak current supplied by the energy supply means in dependence on the load voltage, and timing control means connected to said means for monitoring and controlling for causing the second periods to all have the same duration and, for causing the first periods to have durations which vary in a manner to maintain the voltage across the load constant.

4,694,241

TRANSFORMER TAP CHANGER

Luther L. Genuit, Scottsdale, Ariz., assignor to Honeywell Bull Inc., Phoenix, Ariz.

Filed Jun. 6, 1986, Ser. No. 871,344
Int. Cl.[4] H01F *21/12, 33/00*
U.S. Cl. 323—340 **5 Claims**



1. A transformer apparatus selecting one of a plurality of taps of at least two transformers, said transformer taps being taps of a winding of each of said transformers, one of said transformer taps of each of said transformers being a starting tap of said winding and the remaining taps being the selectable taps, said apparatus comprising:

(a) a plurality of jack means each jack means being associated with one of the transformers, each jack means having a plurality of pins corresponding to the plurality of taps, each of said jack means for providing a contact point for each tap of the corresponding transformer, each pin of a respective jack means operatively connected to a predetrmined selectable transformer tap of a corresponding transformer, such that the corresponding selectable taps of each of the transformers is operatively connected to a different corresponding pin for each of the corresponding jack means, and further wherein the starting tap of each transformer is operatively connected to the same corresponding pin of the jack means corresponding to the transformer; and

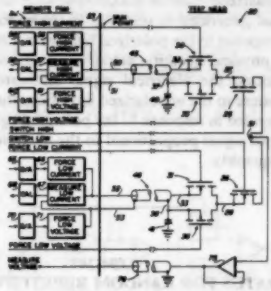
(b) a plurality of plug means, the number of plug means corresponding to one less than the number of pins of said jack means, each plug means having a plurality of mating pin positions corresponding to the pins of said jack means, the mating pin of each plug means that corresponds with the pin of the starting tap being operatively connected to a first supply terminal, and each plug means having a different mating pin from all the other plug means operatively connected to a second supply terminal, for mating with said jack means, such that when a predetermined plug means mates with a predetermined jack means, a predetermined tap is selected.

4,694,242

INTEGRATED CIRCUIT TESTER AND REMOTE PIN ELECTRONICS THEREFOR

John L. Peterson, and Mavin Swapp, both of Mesa, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Continuation of Ser. No. 656,810, Oct. 1, 1984, abandoned. This application Jun. 20, 1986, Ser. No. 876,661
Int. Cl.[4] G01R *31/28*
U.S. Cl. 324—73 R **11 Claims**



1. In an apparatus for providing an interface between an integrated circuit tester, comprising a current between an integrated circuit tester and a pin of a device under test, said apparatus comprising means for forcing current, means for forcing voltage, means for measuring current and means for measuring voltage, the improvement comprising;

first switch means for selectively coupling and decoupling said integrated circuit tester to said pin;

second switch means for selectively coupling and decoupling said means for forcing current of said integrated circuit tester to said first switch means; and

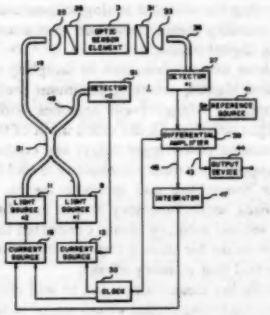
third switch means for selectively coupling and decoupling said means for forcing voltage of said integrated circuit tester to said first switch means.

4,694,243

OPTICAL MEASUREMENT USING POLARIZED AND UNPOLARIZED LIGHT

Robert C. Miller, Salem Township, Westmoreland County, and Juris A. Asars, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 28, 1986, Ser. No. 868,224
Int. Cl.[4] G01R *19/00, 15/07;* G01B *11/00*
U.S. Cl. 324—96 **12 Claims**



1. A method of measuring the magnitude of a physical quantity comprising the steps of:

alternately passing polarized light and unpolarized light through an optical sensor which alters the polarization of the polarized light as a function of the magnitude of the selected physical quantity, but passes the unpolarized light unaffected by the magnitude of the physical quantity;

converting light emerging from the optical sensor into an electrical signal having in response to the polarized light a component proportional to the magnitude of the selected physical quantity;

maintaining the effective intensities of the polarized and unpolarized light in proportion such that the electrical signal generated in response to the unpolarized light and in response to the polarized light with a zero magnitude of the physical quantity, are substantially equal; and

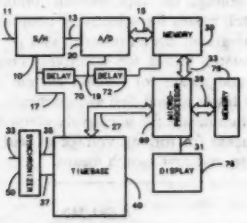
subtracting the electrical signal alternately generated in response to the unpolarized light from the electrical signal generated in response to the polarized light to generate an output signal proportional to the magnitude of the physical quantity.

4,694,244

APPARATUS FOR RANDOM REPETITIVE SAMPLING

Laura Whiteside, and Thomas K. Bohley, both of Colorado Springs, Colo., assignors to Hewlett Packard Company, Palo Alto, Calif.

Filed Feb. 21, 1986, Ser. No. 832,107
Int. Cl.[4] G01R *13/20*; H03M *1/06*
U.S. Cl. 324—121 R **1 Claim**



1. Apparatus for acquiring data using random repetitive sampling in a digital oscilloscope comprising:

sampling means having a clock input, a signal input having an analog value, and an output for setting the output to the analog value of the signal input on rising edges occuring on the clock input;

converter means connected to the sampling means for converting the sampled analog values to digital values,

first memory means connected to converter means for storing digital values,

timebase means connected to sampling means for creating clock signals, counting minimum pretrigger delays, randomizing trigger event searches with respect to rising edges occuring on the clock input of the sampling means, counting post-trigger delays and controlling sampling,

microprocessor means connected to said first memory means for controlling said timebase means, said first memory means, second memory means, and display means,

said second memory means connected to said microprocessor means for storing compilations of digital values stored in said first memory means,

said display means connected to said microprocessor means for displaying digital values stored in said second memory means,

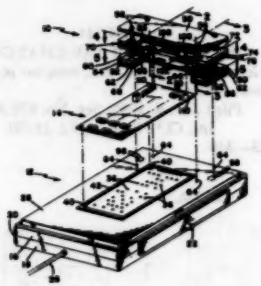
synchronizer means connected to said timebase means for locating user-determined trigger events.

4,694,245

VACUUM-ACTUATED TOP ACCESS TEST PROBE FIXTURE

T. Michael Frommes, Minnetonka, Minn., assignor to Precision Drilling, Inc., Minnetonka, Minn.

Filed Sep. 7, 1984, Ser. No. 648,786
Int. Cl.[4] G01R *1/04*
U.S. Cl. 324—158 F **13 Claims**



1. Top access test probe apparatus for use with a vacuum-actuated test fixture having a movable top platen and a vacuum chamber defined below the platen, which comprises:

a contact board mounted adjacent to a circuit board under test on the platen of the test fixture for movement therewith;

a plurality of pairs of electrically interconnected contact pads provided on opposite sides of said contact board;

a probe block;

means for supporting said probe block on said contact board for linear reciprocal movement relative to the circuit board under test;

a plurality of pairs of electrically interconnected depending test probes mounted on said probe block for movement therewith, one test probe of each pair being positioned for engagement with a contact pad on said contact board and the other test probe of each pair being positioned for engagement with a predetermined point on the top of the circuit board under test;

a pair of laterally spaced apart bellows sealingly engaged between said probe block and said contact board, said probe block being normally biased upwardly away from the circuit board by said bellows; and

means extending between said bellows and said vacuum chamber for fluidly interconnecting said bellows and the vacuum chamber of the test fixture so that said probe block and said test probes thereon are vacuum-actuated downwardly into engagement with the top of the circuit board simultaneously upon acutation of the test

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4,694,246

MOVABLE CORE TRANSDUCER

Jean-Bernard Avisse, Castelneau de Medoc, France, assignor to Societe Anonyme: Societe Europeenne de Propulsion, Puteaux, France

Filed Sep. 19, 1986, Ser. No. 909,306
Claims priority, application France, Sep. 20, 1985, 85 13970
Int. Cl.[4] G01B *7/14*; H01F *21/06*
U.S. Cl. 324—207 **5 Claims**

1. A movable core transducer of the differential transformer type, comprising:

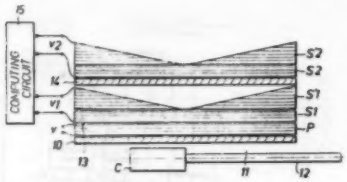
an axisymmetrical passage for a movable core connectable with a member of which the displacement or position is to be measured;

a primary winding wound around said passage and having input terminals to be energized with an input current;

a first secondary winding wound around said primary winding and including a first portion and a second portion arranged in a first phase relationship, said first secondary winding having first output terminals to deliver a first output signal when the primary winding is energized;

a rigid cylindrical support member surrounding said first secondary winding;

a second secondary winding wound around said cylindrical support member and including a first portion and a second portion respectively similar to the first portion and the second portion of the first secondary winding, but arranged in a second phase relationship opposite to said first phase relationship, said second secondary winding having



second output terminals separate from said first output terminals to deliver a second output signal when the primary winding is energized; and

circuit means connected to said first and second output terminals for delivering a differential output signal representative of the ratio between the sum and the difference of said first and second output signals;

said rigid cylindrical support member completely separating said first and second secondary windings one from the other and allowing the axial position of the second secondary winding with respect to that of the first secondary winding to be varied at the end of the manufacturing process of the transducer to adjust response characteristics thereof.

4,694,247

METHOD AND APPARATUS INCLUDING A CUSHION OF PULVERULENT MAGNETIC MATERIAL FOR STRAY FIELD MAGNETIC TESTING OF FERROMAGNETIC PARTS

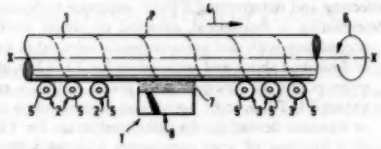
Ernst Meili, Uster, and Karl Rimmele, Schmerikon, both of Switzerland, assignors to MECAPEC S.A., St. Gallen, Switzerland

Filed Jun. 6, 1985, Ser. No. 741,812

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1984, 3421404; Jun. 25, 1984, 3423368

Int. Cl.[4] G01N *27/84;* G01R *33/12*

U.S. Cl. 324—216 **24 Claims**



9. Apparatus for stray flux magnetic testing of an elongated ferromagnetic part for defects, comprising magnet means for establishing and maintaining a magnetic field; drive means for rotating the part to be tested in said magnetic field about an axis which extends in the longitudinal direction of the part whereby a stray magnetic flux develops at the locations of defects in the rotating part, said drive means including means for advancing the part longitudinally along a predetermined path; and marking means for establishing and maintaining a stationary cushion of dry pulverulent magnetic material at a fixed location and in contact with the rotating part so that the stray flux or fluxes, if any, attract such pulverulent material which thereby pinpoints the locations of defects.

4,694,248

MAGNETIC FIELD SENSOR COMPENSATED FOR OFFSET ERROR

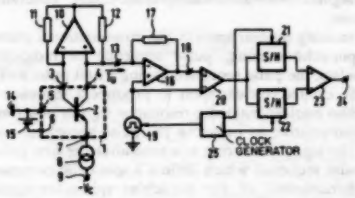
Srdjan Kordi, Delft; Victor Zieren, Eindhoven, and Simon Middelhoek, Rijswijk, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 27, 1984, Ser. No. 574,773

Claims priority, application Netherlands, Feb. 15, 1983, 8300557

Int. Cl.[4] G01R *33/02;* H03K *17/90, 19/18*

U.S. Cl. 324—252 **20 Claims**



1. A magnetic field sensor comprising, a magnetic field-sensitive element having an output for supplying a signal which is a measure of a magnetic field detected by said element, and a circuit for setting the sensitivity of said element to the magnetic field comprising, a modulator operatively coupled to said element for varying the sensitivity setting of the magnetic field-sensitive element between first and second different values so as to derive first and second different sensitivity curves, respectively, for said element, and a detection circuit coupled to said element for detecting a difference in signals at the output of the field-sensitive element as a function of the difference of said first and second sensitivity curves thereby to produce an output signal in which the influence of an offset error component in said signals is reduced, said error component being formed by a signal present at the output in the absence of a magnetic field.

4,694,249

METHOD FOR RECORDING THE NUCLEAR MAGNETIC RESONANCE FOR USE IN VNMR TOMOGRAPHY

Hans Post, Schriesheim; Dieter Ratzel, Rheinstetten; Peter Brunner, Ettlingen, and Bertold Knüttel, Rheinstetten-Moersch, all of Fed. Rep. of Germany, assignors to Bruker Medizintechnik G.m.b.H., Fed. Rep. of Germany

Continuation of Ser. No. 474,698, Mar. 11, 1983, abandoned. This application Dec. 27, 1985, Ser. No. 815,118

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1982, 3209810

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **15 Claims**

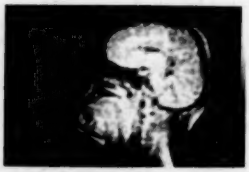
1. A nuclear-magnetic-resonance tomographic method for producing a sequence of images derived from an ensemble of nuclear spins within a preselected cross-sectional plane passing through a body, each image being associated with a particular time and representing a two-dimensional distribution of nuclear-spin polarization of the ensemble of nuclear spins in the plane, different images representing different two-dimensional distributions of nuclear-spin polarization from the same ensemble of nuclear spins as a result of different degrees of spin relaxation of the polarization at different locations within the

cross-sectional plane at the diffferent times of the images, the method comprising the steps of:

(a) subjecting at least a portion of the body which includes the preselected cross-sectional plane to a polarizing magnetic field to polarize the nuclear spins in the plane, the polarizing magnetic field being essentially static and effectively homogeneous in the cross-sectional plane;

(b) superimposing upon said polarizing magnetic field in the cross-sectional plane at least one magnetic-resonance-tomographic-imaging magnetic gradient field produced in accordance with a magnetic-resonance-tomographic-image generation process, each magnetic gradient field having a field component directed essentially parallel to the polarizing magnetic field, the magnetic-resonance-tomographic-imaging magnetic gradient fields varying in magnitude along directions relative to the preselected cross-sectional plane effective to permit nuclear-magnetic-resonance signals to be tomographically detected from nuclear spins located in the plane in accordance with the magnetic-resonance-tomographic-image generation process;

(c) exciting nuclear spins in the cross-sectional plane with a spin-echo-inducing pulse sequence of radio-frequency pulses, the pulse sequence having a first pulse and causing the excited nuclear spins to produce a sequence of spin-echo nuclear-magnetic-resonance signals in a timed relation relative to pulses in the pulse sequence, each spin-echo signal occurring at a time after the first pulse of the pulse sequence which defines a spin-echo-occurance time characteristic of the particular spin-echo signal, each spin-echo signal being representative of a distribution of



nuclear-spin polarization resulting from the ensemble of nuclear spins in the cross-sectional plane under the influence of the polarizing magnetic field and the magnetic gradient fields with the nuclear spins at each different location within the plane at the degree of spin relaxation characteristic of the location at the spin-echo-occurance time of the spin-echo signal;

(d) repeating steps (b) and (c) a tomographic-image-generation number of times less one, at least one magnetic-resonance-tomographic-imaging magnetic gradient field being altered with each repetition of step (b) in accordance with the magnetic-resonance-tomographic-image generation process, each repetition of steps (b) and (c) producing a sequence of spin-echo nuclear magnetic-resonance signals, each spin-echo signal in the sequence being characterized by one of the spin-echo occurance times;

(e) digitizing at least a portion of each spin-echo signal; and

(f) for each spin-echo occurance time, combining the digitized spin-echo signals associated with the particular spin-echo occurance time produced by the tomographic-image generation number of spin-echo-inducing pulse sequences to form a magnetic-resonance-tomographic-image in accordance with the magnetic-resonance-tomographic-image generation process, each image being characterized by the spin-echo occurance time of the digitized spin-echo signals combined to form the image and representing the two-dimensional distribution of nuclear-spin polarization resulting from the ensemble of nuclear spins in the cross-sectional plane and reflecting the different degrees of spin relaxation at different locations of the nuclear spins within the plane at the spin-echo occurance time.

4,694,250

NUCLEAR MAGNETIC RESONANCE IMAGING DEVICE

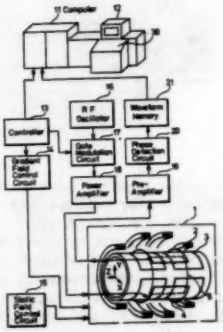
Hideto Iwaoka; Tadashi Sugiyama; Hiroyuki Matsuura, and Takaaki Hirata, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Feb. 24, 1986, Ser. No. 833,224

Claims priority, application Japan, Feb. 27, 1985, 60-38235; Feb. 27, 1985, 60-38236; Mar. 6, 1985, 60-44158; Aug. 30, 1985, 60-191528; Aug. 30, 1985, 60-191529; Sep. 5, 1985, 60-196661

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **29 Claims**



1. A nuclear magnetic resonance imaging device comprising control and computation means, wherein radio frequency pulses and magnetic fields are applied to an object in time relationships designated by said control and computation means to generate nuclear magnetic resonance signals and an image of said object is obtained by using said nuclear magnetic resonance signals; wherein said device further comprises an operation console having input means for setting input information desired for said device; said control and computation means being adapted to store relaxation times **T1**, **T2**, nuclei density ρ, pulse sequences suitable for obtaining a calculated image, and scan conditions, including scan parameters; said scan conditions being determined externally or internally by the following procedure and being used as scan conditions; said scan conditions being read out from said control and computation means under designation from said operation console and said image being taken in accordance with said scan conditions;

wherein said procedure comprises

selecting and determining a pulse sequence to be used;

determining a theoretical equation of signal intensity in accordance with said pulse sequence selected in a manner as described above and with values for **T1**, **T2**, ρ, at one or more points, as representative points within a range of values **T1**, **T2**, ρ, to be noted, and determining a variance or standard deviation of a calculated image for **T1**, **T2**, ρ, as a function of scan parameters from said theoretical equation and variance in values for **T1**, **T2**, ρ

and original image; and

determining scan parameters with which a total sum of said variance or standard deviation of desired calculated image, or a total sum of weighted variance or standard deviation of said desired calculated image, among said calculated images for **T1**, **T2**, ρ, takes a local minimum value, and using said scan parameters as optimum scan conditions.

4,694,251
METHOD AND APPARATUS FOR NUCLEAR MAGNETIC RESONANCE IMAGING

Eiji Yoshitome, and Kazuya Hoshino, both of Tokyo, Japan, assignors to Yokogawa Medical Systems, Limited, Tokyo, Japan

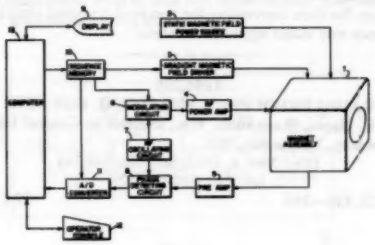
PCT No. PCT/JP85/00370, § 371 Date Feb. 21, 1986, § 102(e) Date Feb. 21, 1986, PCT Pub. No. WO86/00706, PCT Pub. Date Jan. 30, 1986

PCT Filed Jul. 2, 1985, Ser. No. 840,570

Claims priority, application Japan, Jul. 3, 1984, 59-137004

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **12 Claims**



1. A method of nuclear magnetic resonance imaging employing the Fourier transform imaging, comprising the steps of:

measuring the view data G(k,t) for the body which is under diagnosis, under the condition that there is a specific value of twist of spin phase within said body, in a specific direction;

measuring the view data G(−k,t) for the body which is under diagnosis, under the condition that the value of twist of the spin phase within said body is equal in amount and of opposite direction to the aforementioned value of twist of spin phase, with the time which elapses between said measurements of G(k,t) and G(−k,t) being sufficiently short that any change in the static magnetic field occurring therein can be ignored;

deriving from said view data G(k,t) and G(−k,t) the data $G(k,t_O)$ and $G(-k,-t_O)$, for the respective time points t_O and $-t_O$ which are mutually symmetrically disposed with respect to the time origin of said view data G(k,t) and G(−k,t);

deriving the complex conjugate $\overline{G(-k,-t_O)}$ of the data $G(-k,-t_O)$;

deriving a value A which is the ratio $G(k,t_O)/\overline{G(-k,-t_O)}$, and;

correcting measured data by a signal which is proportional to the argument arg(A) of the ratio A.

4,694,252
AUTOMATED ESTIMATION OF T1 AND T2 RELAXATION TIMES

Stephen J. Riederer; Ronald C. Wright, and James N. Lee, all of Durham, N.C., assignors to Duke University, Durham, N.C.

Continuation-in-part of Ser. No. 734,101, May 15, 1985, Pat. No. 4,641,095. This application Jan. 31, 1986, Ser. No. 824,784

Int. Cl.[4] G01R *33/20*

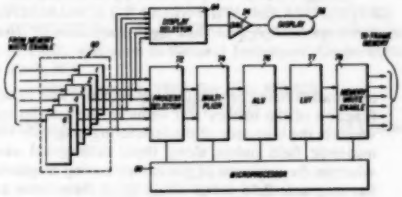
U.S. Cl. 324—309 **9 Claims**

1. A method for determining the spin-lattice relaxation time T1 of an image during a Nuclear Magnetic Resonance (NMR) measurement technique on a human body comprising the steps of:

subjecting said body to magnetic fields in accordance with a NMR technique at two different predetermined stored pulse repetition times TR1 and TR2;

measuring a first signal S(TR1) at a first one (TR1) of said two repetition times including the steps of setting a longitudinal magnetization to zero, waiting a first period of time equal to a first pulse repetition time TR1, and then flipping the longitudinal magnetization MZ by 90° into the x-y plane wherein the value of x-y plane magnetization immediately after the step of flipping is said first signal, called the transverse magnetization, which is equal to the value of the longitudinal magnetization immediately prior to the step of flipping and wherein said first signal S(TR1) is expressed by a first equation $S(TR1)=M_0[1-\exp(-TR1/T1)]$ where M_0 is a constant representing the net magnetization;

measuring a second signal at a second one (TR2) of said two repetition times including a step of setting a longitudinal magnetization to zero, waiting a second period of time equal to said second pulse repetition time TR2, and then flipping the longitudinal magnetization by 90° into the x-y plane, wherein the value of the x-y plane magnetization immediately after the step of flipping is said second signal, called the transverse magnetization, which is equal to the value of the longitudinal magnetization immediately prior



to the step of flipping and wherein said measured second signal S(TR2) is expressed by a second equation $S(TR2)=M_0[1-\exp(-TR2/T1)]$;

storing the value of said measured first signal in a first memory frame and the value of said measured second signal in a second memory frame;

inverting, through the use of a look-up table the value of said measured second signal stored in said second memory frame and storing said inverted value in said second frame memory;

multiplying the value of the contents of said first memory frame by the value of the contents of said second memory frame through the use of a microprocessor controlled multiplier in order to form a product R and storing said product R in said first memory frame;

mapping the value of R stored in said first memory frame to T1 in a microprocessor controlled look-up table using the transformation $R=[1-\exp(-TR1/T1)]/[1-\exp(-TR2/T1)]$;

the value T1 obtained from said transformation.

4,694,253
PROCESS FOR THE MODULATION OF THE SPEED EFFECT OF MOVING PARTS OF A BODY IN A NUCLEAR MAGNETIC RESONANCE DENSITY MEASUREMENT AND PERFORMANCE OF THE PROCESS IN ORDER TO DEDUCE THEREFROM THE SPEED OF THE MOVING PARTS IN QUESTION

Patrick Le Roux, Paris, France, assignor to Thomson-CGR, Paris, France

Filed Dec. 12, 1985, Ser. No. 808,049

Claims priority, application France, Aug. 13, 1985, 85 12352

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **14 Claims**

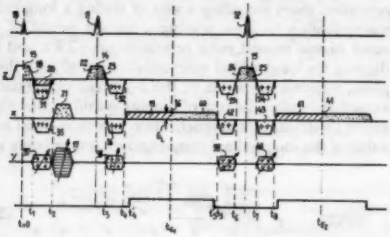
1. A process for the modulation of the speed effect of the moving parts of a body in a density measurement by nuclear magnetic resonance, comprising the steps of;

exposing said body to an orienting, constant magnetic field for orienting in a single direction the magnetic spin moments of the body;

subjecting said body to a radio frequency magnetic excitation in the presence of and/or followed by the application of a sequence of an interfering magnetic field; and

detecting a magnetic resonance signal emitted in response by the body;

wherein the effect of the speed of the moving parts of the body created by the sequence of the interfering field is modulated by the application, prior to the step of detecting, of a sequence of a compensating magnetic field, an integral of said compensating magnetic field calculated on



its duration being zero, and whose history and value are a function of the history and value of the interfering field wherein the sequence of the interfering magnetic field has magnetic field pulses along three orthogonal axes and wherein the sequence of the compensating magnetic field has magnetic field pulses along these three same axes, in order to individually modify the effects of the speed of the moving parts of the body along said three axes wherein the compensating magnetic field pulses are determined a priori by position and duration Γ; and,

wherein amplitude λ is evaluated to obtain the modulation.

4,694,254

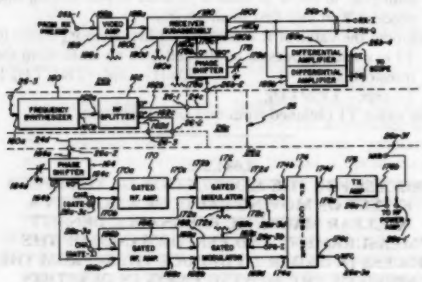
RADIO-FREQUENCY SPECTROMETER SUBSYSTEM FOR A MAGNETIC RESONANCE IMAGING SYSTEM

Dimitrios Vatis, and Lowell S. Smith, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 10, 1985, Ser. No. 743,121

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **20 Claims**



1. A radio-frequency (RF) spectrometer subsystem, for a nuclear magnetic resonance system for the production of images and localized chemical-shift spectra from a non-ferromagnetic sample, said system having antenna means for providing an RF magnetic field within a magnet means bore and in the sample when contained therein, responsive to a modulated radio-frequency excitation signal, and also for receiving radio-frequency energy re-radiated from the sample for forming a response signal, said subsystem comprising:

transmitter means for providing a first signal with at least a desired amplitude characteristic and a desired frequency characteristic responsive to at least one control signal from said system;

means for amplifying said first signal to the amplitude required of said excitation signal;

linearizing means coupled to said amplifying means for minimizing any change in the relative characteristics of any portion, with respect to any other portion, of the excitation signal, to the relative characteristics of the same portions of a selected one of said at least one control signal and said first signal;

means for providing at least one reference signal for obtaining at least one of phase information from, noise reduction in and/or coherent detection of, the received response signal; and

means for then converting the received response signal to at least one video signal for analysis.

4,694,255

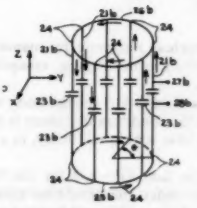
RADIO FREQUENCY FIELD COIL FOR NMR

Cecil E. Hayes, Wauwatosa, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Nov. 4, 1983, Ser. No. 548,745

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—318 **57 Claims**



1. An NMR radio-frequency (RF) coil comprising:

a pair of conductive loop elements disposed in a spaced apart relation along a common longitudinal axis; and

a plurality of conductive segments each having at least one reactive element in series therewith, said segments electrically interconnecting said loop elements at points spaced along the periphery of each of said loops, said segments being disposed substantially parallel to said longitudinal axis such that the resulting configuration has four-fold symmetry, wherein in operation said RF coil is capable of producing an RF field useful for performing NMR studies.

4,694,256

COMPENSATION CIRCUIT FOR PULSE SIGNALS

Keiichi Kawamura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 7, 1985, Ser. No. 699,176

Claims priority, application Japan, Feb. 8, 1984, 59-19886

Int. Cl.[4] H03K *5/153, 5/19, 3/013*

U.S. Cl. 328—120 **8 Claims**

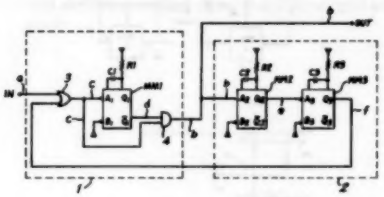
1. A compensation circuit for pulse signals comprising a noise-pulse cutting circuit and a compensation-pulse generating circuit coupled to an output terminal of the cutting circuit, there being a first, a second and a third monostable multivibrator, said first multivibrator being operative in a stable state and in a quasi-stable state; and wherein

said cutting circuit comprises:

said first multivibrator, said first multivibrator being responsive to an input pulse signal applied to said cutting circuit periodically at a predermined period for assuming the quasi-stable state in response to each pulse of the input signal, the duration of quasi-stable state being slightly

shorter than said period, said first multivibrator reverting to the stable state at the conclusion of a quasi-stable state; and

a gate circuit providing an output pulse of said cutting circuit at said output terminal of said cutting circuit, said gate circuit being operatively connected to an output terminal of said first multivibrator to allow passage of a pulse of said input pulse signal via said output terminal of said cutting circuit to said generating circuit during each stable state and to block passage of a pulse of said input pulse signal to said generating circuit during each quasi-stable state, thereby implementing a pulse-cutting mode of said cutting circuit for blocking a noise pulse occurring during a quasi-stable state of said first multivibrator; and wherein said generating circuit comprises:



said second multivibrator, said second multivibrator assuming a quasi-stable state in response to a pulse outputted by said gate circuit for an interval of time slightly longer than said period, said second multivibrator reverting to a stable state at the conclusion of quasi-stable state; and

said third multivibrator, said third multivibrator being triggered by said second multivibrator upon a transistion in said second multivibrator from a quasi-stable state to a stable state generate a compensation pulse at an output terminal of said generating circuit; and wherein

said compensation circuit further comprises means for outputting: an output pulse of said cutting circuit during the presence of a pulse of said input pulse signal, and said compensation pulse of said generating circuit upon an absence of a pulse of said input pulse signal.

4,694,257

PHASE-COHERENT DEMODULATION CLOCK AND DATA RECOVERY

Michael T. Klein, Ann Arbor, Mich., and Donald J. Voss, Phoenix, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

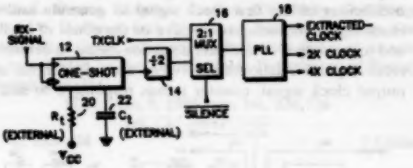
Filed Jun. 17, 1986, Ser. No. 875,038

Int. Cl.[4] H03D *3/18*

U.S. Cl. 329—50 **7 Claims**

1. A phase-coherent demodulator for use with a transmitted signal having at least two phase-coherent frequencies comprising:

clock recovery means for generating from said transmitted signal a clock signal which has the same frequency as the lowest of said phase-coherent frequencies; and



data recovery means coupled to said clock recovery means for generating separate signals corresponding to said at least two phase-coherent frequencies.

4,694,258

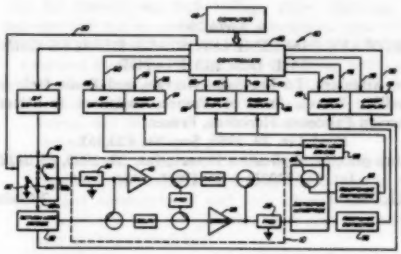
METHOD AND SYSTEM OF ENHANCING PERFORMANCE OF FEEDFORWARD AMPLIFIERS

Robert M. Blumenkranz, Brea, and Mark A. Gibbons, Anaheim, both of Calif., assignors to General Instrument Corporation, New York, N.Y.

Filed Mar. 14, 1986, Ser. No. 840,428

Int. Cl.[4] H03F *1/32*

U.S. Cl. 330—2 **17 Claims**



1. A method of enhancing the performance of a feed forward amplifier which includes operational characteristics of frequency response, input return loss, output return loss, input loop null response and output loop null reponse, comprising the steps of:

monitoring each of said operational characteristics on a repeating and alternating basis;

independently displaying each monitored characteristic on a real-time basis such that all of said characteristics may be viewed together; and

adjusting components of the amplifier while viewing the displayed characteristics to achieve a desired combination of the displayed characteristics.

4,694,259

DATA TRACKING CLOCK RECOVERY SYSTEM HAVING MEDIA SPEED VARIATION COMPENSATION

Richard C. Carickhoff, Lansdale; Hakan O. Hemdal, West Chester, and Alvin L. Schultz, East Greenville, all of Pa., assignors to Laser Magnetic Storage International Company, Colorado Springs, Colo.

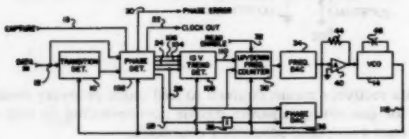
Filed Sep. 29, 1986, Ser. No. 912,879

Int. Cl.[4] H03L *7/08*

U.S. Cl. 331—1 A **5 Claims**

1. In a clock recovery system for generating an output clock signal locked to the phase and frequency of an input data rate, said input data rate comprising a sequence of data signals, said system comprising data detection means for detecting said data signals, oscillator means responsive to an analog signal for

generating a first clock signal having a frequency representative of the value of said analog signal, phase detector means responsive to said first clock signal for cyclicly counting the oscillations of the first clock signal to generate said output clock signal and being responsive to the count of oscillations and to the output of said data detection means to determine the relative phase relationship between each data signal and the output clock signal, counter means responsive to said phase



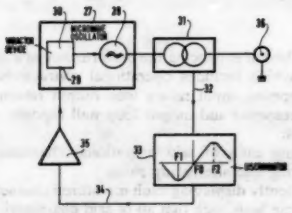
detector means for containing a count representative of the frequency of said first clock signal and being responsive to the phase relationship determined by said phase detector means to selectively increment or decrement the count therein, and converter means responsive to the count in the counter means to generate said analog signal which drives the oscillator means, the improvement comprising: a media speed variation detector means responsive to said phase detector means for accelerating the change in count in said counter means.

4,694,260

MICROWAVE DISCRIMINATOR AND DEVICES USING SAID DISCRIMINATOR

Lazare Argintaru, Le Pre Saint Gervais, and Denis Hebrard, Levallois Perret, both of France, assignors to Alcatel Thomson Faisceaux Hertziens, France

Filed Jan. 29, 1986, Ser. No. 823,862
Claims priority, application France, Jan. 29, 1985, 85 01207
Int. Cl.[4] H03D *3/26;* **H03L** *1/04, 7/04*
U.S. Cl. 331—9 **7 Claims**



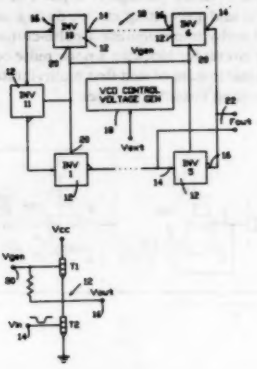
1. A microwave frequency discriminator, comprising:
a microwave inlet circuit for a microwave to be discriminated;
a pair of microwave dielectric resonators having resonant frequencies F_1 and F_2 situated on either side of the frequency F_0 of the microwave to be discriminated, said resonators being made of respective materials such that the resonant frequencies of said resonators tend to vary in opposite direction with changing temperature;
a first microwave coupling device extending between said inlet circuit and each of said resonators;
a pair of detector circuits;
respective microwave coupling devices extending between each of said resonators and a corresponding respective one of said pair of detector circuits, said detector circuits having output terminals which are connected in series-opposition in the manner of a Travis discriminator; and
a discriminated outlet being taken from said output terminals of said pair of detector circuits.

4,694,261

INTEGRATED HIGH GAIN VOLTAGE CONTROLLED OSCILLATOR

John F. Ewen, Yorktown Heights, N.Y., and Joseph M. Mosley, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1986, Ser. No. 924,701
Int. Cl.[4] H03B *1/00*
U.S. Cl. 331—57 **10 Claims**



1. A voltage controlled oscillator comprising:
a plurality of inverter stages connected in a ring configuration, each said inverter stage having an input terminal and an output terminal with the input terminal of each said stage being connected to the output terminal of the next preceding stage, each said inverter stage comprising:
first and second transistors each having an emitter, a base and a collector, wherein the base of said first transistor is the inverter stage input terminal and the collector of said first transistor is the inverter stage output terminal, the emitter of said second transistor being connected to the collector of said first transistor, the collector of said second transistor being connected to a first power supply terminal and the emitter of said first transistor being connected to a second power supply terminal, and
a resistor connected between the base and the emitter of said second transistor;
generator means connected to the base of said second transistor is each of said inverter stages for providing a control voltage thereto; and
oscillator output terminals connected between the input and output terminals of one of said plurality of inverter stages.

4,694,262

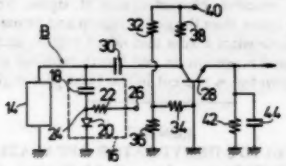
OSCILLATOR WITH RESONATOR HAVING A SWITCHED CAPACITOR FOR FREQUENCY CHANGING

Atsushi Inoue, 51-15, Oneo, Hirono-cho, Uji-shi, Kyoto; Yuji Kuroda, 653-6, Namazu-cho, Fushimi-ku, Kyoto-shi, Kyoto, and Sadahiro Tamura, 3-1-72, Kitafukunishi-cho, Ohe, Nishikyo-ku, Kyoto-shi, Kyoto, all of Japan

Filed Jul. 18, 1984, Ser. No. 632,104
Claims priority, application Japan, Jul. 23, 1983, 58-134885
Int. Cl.[4] H03B *5/18*
U.S. Cl. 331—96 **5 Claims**

1. An oscillation circuit comprising:
a dielectric resonator of a coaxial Transverse Electromagnetic (TEM) wave type having an oscillation frequency and developing an oscillation voltage signal at said oscillation frequency thereacross; and
frequency switching means connected across said resonator for switching the oscillation frequency of said resonator, said frequency switching means including a capacitor and

a diode connected in series, said diode having a small capacitance as compared to that of said capacitor and forward and reverse conductive voltage values with abso-



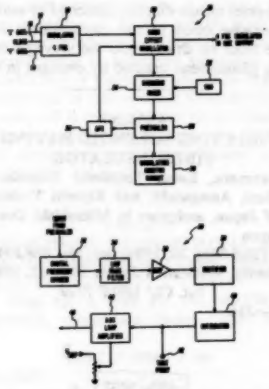
lute values larger than an absolute value of a portion of said oscillation voltage signal that is developed across said diode.

4,694,263

FREQUENCY MODULATION MONITOR CIRCUIT AND METHOD

Richard A. Cross, Garland, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 9, 1986, Ser. No. 872,074
Int. Cl.[4] G01R 23/15
U.S. Cl. 332—20 10 Claims



1. A method for monitoring frequency deviation of a frequency modulated signal from a system having a modulation oscillator and an automatic frequency control feedback loop, the loop including a harmonic mixer which provides a difference frequency from the signal to a prescaler which provides a divided difference frequency, the method including in combination the steps of:

further dividing the divided difference frequency of the prescaler;

filtering out the carrier frequency from the further divided signal;

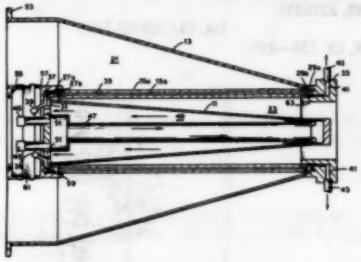
rectifying the carrier filtered singal; integrating the rectified signal; and testing the integrated signal.

4,694,264

RADIO FREQUENCY COAXIAL FEEDTHROUGH DEVICE

Thomas L. Owens, Kingston; Frederick W. Baity, Oak Ridge; Daniel J. Hoffman, Oak Ridge, and John H. Whealton, Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 5, 1986, Ser. No. 836,776
Int. Cl.[4] H01P 5/02
U.S. Cl. 333—34 7 Claims



1. A high voltage radio frequency coaxial feedthrough device for transmitting high voltage radio frequency energy between first and second coaxial transmission lines of different dielectric mediums and pressures, comprising:

a tapered inner coaxial conductor including means for electrical connection at an upstream end thereof to an inner coaxial conductor of said first coaxial line and at a downstream end thereof to an inner coaxial conductor of said second coaxial line;

a tapered outer coaxial conductor including means for electrical connection at the upstream end thereof to an outer coaxial conductor of said first coaxial line and at the downstream end thereof to an outer coaxial conductor of said second coaxial line;

a coaxially disposed cylindrical insulator formed of a rigid, impermeable, electrically insulating material including first and second conductive metal mounting rings sealably brazed to the upstream and downstream ends respectively of said cylindrical insulator, said first ring having an axially extending portion forming a first guard ring which extends axially over a portion of the outer surface of said cylindrical insulator to form a corona shield about the upstream end of said cylindrical insulator, said second ring having an axially extending portion forming a second guard ring which extends over a portion of the inner surface of said cylindrical insulator to form a corona shield about the downstream end of said cylindrical insulator; and

means for removably connecting said cylindrical insulator in a leak-tight sealing arrangement between said first mounting ring of said cylindrical insulator and said inner conductor at the upstream end of said cylindrical insulator and said second mounting ring of said cylindrical insulator and said outer conductor at the downstream end of said cylindrical insulator so that a leak-tight seal is provided between the different pressurized dielectric mediums of said first and second coaxial transmission lines, said inner and outer coaxial conductors being spaced apart and separately tapered uniformly along the outer and inner surfaces respectively inwardly from said upstream end of said cylindrical insulator toward the central axis of said coaxial feedthrough device and said inner surface of said upstream end of said outer conductor being formed of an enlarged diameter axial segment axially aligned with said first mounting ring of said cylindrical insulator so that a constant characteristic impedance is provided along the

entire length of said feedthrough device while minimizing the insertion-voltage standing wave ratio of said feedthrough device.

4,694,265

DEVICE FOR FILTERING A HIGH-FREQUENCY CONDUCTOR SUSCEPTIBLE TO ELECTROMAGNETIC INTERFERENCE OF A HIGH-FREQUENCY SPACE

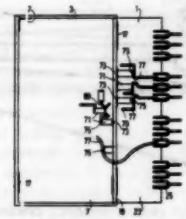
Karl H. Kupper, Krefeld, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 16, 1984, Ser. No. 631,021

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1983, 3325357

Int. Cl.⁴ H03H 7/01

U.S. Cl. 333—185 **1 Claim**



1. A device for leading a high-frequency conductor out of a shielded high-frequency space, comprising a filtering capacitor that is arranged in the area where the conductor passes through a grounded wall, and that is electrically coupled to said grounded wall, wherein the conductor to be led out of the shielded high-frequency space is a planar conductor carried by a circuit board, and said filtering capacitor comprises a chip film capacitor mounted on a side of said circuit board preselected for immersion in a soldering bath to the exclusion of the other side, said chip film capacitor for filtering the high-frequency conductor from electromagnetic interference, wherein a first contact surface of said chip film capacitor is coupled to said grounded wall of the shielded high-frequency space and a second contact surface of said chip film capacitor is electrically coupled to said high-frequency conductor.

4,694,266

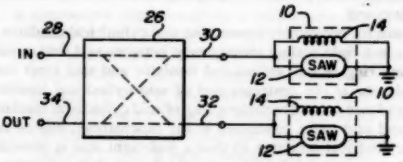
NOTCH FILTER

Peter V. Wright, Dallas, Tex., assignor to R. F. Monolithic, Inc., Dallas, Tex.

Filed Jul. 29, 1986, Ser. No. 891,238

Int. Cl.⁴ H03H 9/64, 7/09

U.S. Cl. 333—196 **12 Claims**



1. An improved notch filter for rejecting a predetermined band of signal frequencies from an input signal comprising:

a. a quadrature coupler having first, second, third, and fourth terminals, said first terminal being a signal input terminal and said fourth terminal being an output terminal,

b. a first tuned surface acoustic wave device coupled to said second one of said terminals for receiving said input signal with 0° phase shift, said first tuned device having primarily reactive characteristics at signal frequencies higher or lower than the notch region and primarily resistive characteristics across said notch region, and

c. a second tuned surface acoustic wave device coupled to a third one of said terminals for receiving said input signal with a 90° phase shift, said second tuned device having primarily reactive characteristics at signal frequencies higher or lower than the notch region and primarily resistive characteristics across said notch region, such that no output signal is present on said fourth terminal across said notch region but is present in the band pass region.

4,694,267

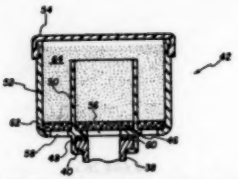
WAVEGUIDE DEHYDRATOR APPARATUS

Dennis J. Guill, Richardson; Larry D. McPherson, Allen, and John H. Sizelan, Eastland, all of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 8, 1986, Ser. No. 894,424

Int. Cl.⁴ H01P 1/30

U.S. Cl. 333—248 **3 Claims**



1. Waveguide apparatus comprising, in combination:

a radio;

an antenna;

waveguide means connected between said radio and said antenna for passing signals between said radio and said antenna, said waveguide means including a further port; and

desiccant vessel means directly attached to said further port and otherwise open to the environment for removing moisture from air drawn into the waveguide means by a pumping phenomena created by changes in temperature.

4,694,268

SUPERCONDUCTING SOLENOID HAVING ALUMINA FIBER INSULATOR

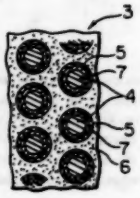
Toshimi Kawamura, Kobe; Tadatoshi Yamada, Amagasaki; Kiyoshi Hani, Amagasaki, and Kiyoshi Yoshizaki, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed May 30, 1986, Ser. No. 868,554

Claims priority, application Japan, May 31, 1985, 60-119123

Int. Cl.⁴ H01F 7/22

U.S. Cl. 335—216 **6 Claims**



1. A superconducting solenoid comprising a winding frame, wires formed of filamentary conductors having superconductivity and wound around said winding frame, an insulator formed of alumina fiber material and covering each of said wires for providing electrical insulation, and a resinous mate-

rial impregnated in between turns of said wires so as to provide a supporting structure.

4,694,269

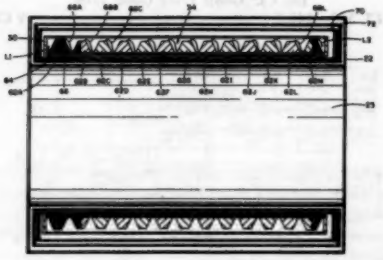
MAGNET SYSTEM AND METHOD OF ITS MANUFACTURE

Sibley C. Burnett; John R. Purcell, both of San Diego, and M. Harlan Horner, Del Mar, all of Calif., assignors to GA Technologies Inc., San Diego, Calif.

Filed Aug. 8, 1984, Ser. No. 638,876

Int. Cl.⁴ H01F *7/22*

U.S. Cl. 335—216 **17 Claims**



1. A magnet system for providing a localized, substantially homogeneous magnetic field for use in nuclear magnetic resonance imaging, said magnet system comprising:

a vacuum vessel defining a bore for receiving the subject of the imaging;

a cryogenic containment vessel supported within said vacuum vessel; and

a single coil disposed within said containment vessel for providing said magnetic field, said coil comprising a winding made up of thousands of turns of small superconductive wire, said winding having a modular geometry including a plurality of axially serially disposed modules with space provided between adjacent modules, said coil further comprising an insulative substance, having a different coefficient of thermal contraction than that of said wire, distributed in said winding whereby as the temperature of said coil is reduced from room temperature to its cryogenic operating temperature, the development of localized stress concentrations sufficient to structurally damage the coil, are avoided.

4,694,270

ELECTROMAGNETIC PROPORTIONAL ACTUATOR

Koji Ichihashi, Higashimatsuyama, Japan, assignor to Diesel Kiki Co. Ltd., Tokyo, Japan

Filed Apr. 1, 1986, Ser. No. 846,878

Claims priority, application Japan, Apr. 9, 1985, 60-051657[U]

Int. Cl.⁴ H01F *7/08*

U.S. Cl. 335—260 **11 Claims**

1. An electromagnetic proportional actuator comprising:

a housing;

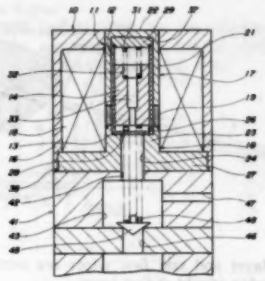
a plunger received in said housing and being movable axially thereof;

an actuating member having one end thereof associated with one axial end face of said plunger, said actuating member comprising a coil spring having one end thereof abutting against said one axial end face of said plunger;

a solenoid wound around an outer peripheral surface of said housing;

said plunger being axially displaceable in response to electric current passing through said solenoid to drive said actuating member; and

a tubular member formed of a non-magnetic material and disposed between an outer peripheral surface of said plunger and an inner peripheral surface of said housing such that said plunger is axially slidable within said tubular



member, whereby said plunger is prevented from being attracted to the inner peripheral surface of said housing.

4,694,271

DEVICE FOR STABILIZING MAGNETIC ZONES

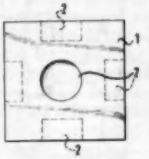
Bruno Rohde, Blindenhaselbach 6, 8267 Neumarkt-St. Veit, Fed. Rep. of Germany

Filed Apr. 11, 1986, Ser. No. 850,675

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1985, 3513281

Int. Cl.⁴ H01F *7/02*

U.S. Cl. 335—302 **4 Claims**



1. A device for stabilizing magnetic zones by means of magnets, comprising a cube of non-magnetic material, a separate magnet connected in the middle of each side of said cube whereby the magnets on each side of the cube are separated from each other, the magnets being in the form of plates having flat surfaces positioned perpendicular to the direction of a magnetic zone, each of said magnets having a single polarity on each side and all outwardly facing flat surfaces of all of the magnets being of the same polarity, and the magnets on opposite sides of said cube being spaced from each other a distance such that the magnetic influence on each other is just avoided.

4,694,272

ELECTRIC POTENTIOMETER

Wolfgang Maisch, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 10, 1984, Ser. No. 648,436

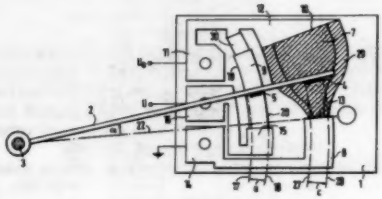
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1983, 3341236

Int. Cl.⁴ H01R *13/46*

U.S. Cl. 338—138 **3 Claims**

1. An electric potentiometer having an electrically nonconductive carrier plate, a first wiper and a first electrically conductive layer which is to be swept over by said first wiper, said first conductive layer comprises paste material having embedded carbon particles therein, characterized in that a sliding layer of electrically nonconductive paste material is applied to said carrier plate in a region of said first electrically conductive

layer, and said first electrically conductive layer is applied on at least a portion of said sliding layer, and said first electrically



conductive layer and said first wiper are narrower than a narrowest region of said sliding layer.

4,694,273

DEVICE FOR INDICATING ABNORMAL PRESSURE CONDITIONS IN A TIRE ON A MOTOR VEHICLE IN MOTION

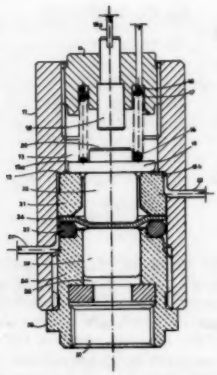
Domenico Franchino, Via Chisola 19/A, Cumiano (Turin), Italy

Filed Oct. 24, 1985, Ser. No. 790,827

Claims priority, application Italy, Nov. 5, 1984, 68098 A/84

Int. Cl.[4] B60C *23/02*

U.S. Cl. 340—58 **9 Claims**



1. Device for indicating abnormal pressure conditions in a tire on a motor vehicle in motion, consisting of: a pressure sensor having a movable element and opposing spring which closes a transmitter circuit when it reaches one of two limit positions correspolnding to an upper and lower limit in a range of normal pressure values, and a receiver that picks up the transmitter signals and activates a visual and/or acoustic alarm, characterized in that the aforesaid sensor is composed of a substantially cylindrical case with its internal cavity divided into two parts, the first of which houses the movable element, in permanent electrical contact with one of the transmitter's terminals, and is closed by a first adjustable ring nut that determines one of the limit positions, while the other part is divided into two chambers, that communicate with the first part and the inside of the tire respectively, by means of a flexible membrane whose edges are held with a seal ring between a bush made of conductive material, that determines the second limit position, and a second ring nut screwed into a fixed position in the cavity in the case; in that both the bush and the second ring nut have axial cavities that house a first and a second piston, of which the first piston is held between the membrane and the movable element, and the second piston rests one end against the membrane and has the other end free and exposed to the tire pressure, these pistons keeping the movable element half way between the two limit positons as long as the pressure remains within a range of values that has been defined normal; and in that the aforesaid receiver has logic outputs for connection with a tachograph and/or on-board computer.

4,694,274

DATA COMPARISON CIRCUIT CONSTRUCTED WITH SMALLER NUMBER OF TRANSISTORS

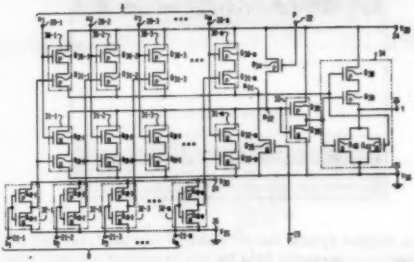
Jiroh Shimada, and Hiroshi Morito, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 21, 1984, Ser. No. 685,149

Claims priority, application Japan, Dec. 23, 1983, 58-243319

Int. Cl.[4] G05B *1/00*; G06F *7/04*

U.S. Cl. 340—146.2 **9 Claims**



1. A transistor circuit comprising first and second potential terminals, first and second output nodes, at least one first series circuit connected between said first potential terminal and said first output node and including first and second transistors connected in series, at least one second series circuit connected between said second potential terminal and said second output node and including third and fourth transistors connected in series, first means for supplying a first digital signal to control electrodes of said first and third transistors, second means for supplying a second digital signal to control electrodes of said second and fourth transistors, said first and third transistors being of different conductivity types from each other, said second and fourth transistors being of different conductivity types from each other, third means for precharging said first and second output nodes to different logic levels from each other, and fourth means for detecting a change in the level at at least one of said first and second output nodes.

4,694,275

DIGITAL CAPACITANCE INCREMENTAL ENCODER

Karmen D. Cox, St. Charles County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 1, 1986, Ser. No. 858,345

Int. Cl.[4] H03M *1/22*

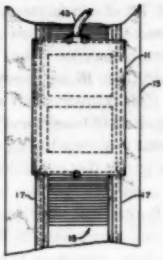
U.S. Cl. 340—347 P **9 Claims**

1. A digital capacitance encoder for encoding position information of first and second mechanical parts movable with respect to each other comprising:

a grid of evenly spaced, parallel conductive lines fixed with respect to one of the mechanical parts, said grid being disposed along the line of movement of one mechanical part with respect to the other;

means for capacitively sensing the conductive lines of the grid, said sensing means including a first pair of interdigitated electrodes fixedly disposed on the other mechanical part along the line of movement with the fingers thereof substantially parallel to the lines of the grid, means for sensing which electrode of the pair has the greatest capacitance to the grid, drive means for applying a square waveform to each electrode, a latch or the like having its set input connected to one of the electrodes and the reset

input connected to the other of the electrodes so that the output of the latch is a function of which electrode has the greatest capacitance to the grid, and a second pair of interdigitated electrodes fixedly disposed on the same mechanical part as the first pair along the lines of movement, said second pair being disposed from the first pair



such that its output differs from that of the first pair as the mechanical parts move with respect to each other; and

means for forcing the sensing means into close proximity with the grid as the mechanical parts are moved with respect to each other, said forcing means being stationary with respect to the sensing means.

4,694,276

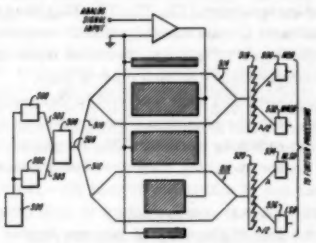
INTERFEROMETRIC ANALOG-TO-DIGITAL CONVERTER AND METHOD FOR OPERATION

Ali Rastegar, Wellesley, Mass., assignor to Analog Devices, Inc., Wilmington, Mass.

Filed Aug. 13, 1986, Ser. No. 896,652

Int. Cl.⁴ H03M *1/00*

U.S. Cl. 340—347 AD **26 Claims**



1. An electrooptic analog-to-digital converter for converting an analog signal to a digital representation comprising:

an optical source for producing a pulsed multiple wavelength sampling beam, wherein the wavelengths are integer multiples of each other,

modulating means responsive to said multiple wavelength optical beam and to said analog signal for generating a multiple wavelength output beam which is a periodic function with a period that is dependent on the sampling beam wavelength and the magnitude of said analog voltage to be converted, and

means responsive to each individual wavelength in said output beam for generating a digital signal representing a single digital bit in a digital representation of said analog signal.

4,694,277

A/D CONVERTER

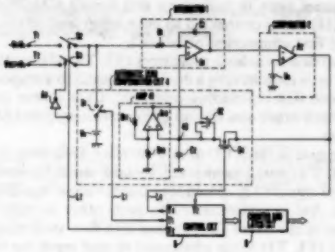
Akinori Takahashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 21, 1986, Ser. No. 831,636

Claims priority, application Japan, Feb. 22, 1985, 60-33807

Int. Cl.⁴ H03M *1/52, 1/82*

U.S. Cl. 340—347 NT **7 Claims**



1. An A/D converter with an automatic zero compensation circuit, comprising: a predetermined voltage; an integrator for receiving as input signals the predetermined voltage in a first step of A/D conversion, a difference between the predetermined voltage and an analog voltage to be A/D converted in a second step, a sum of the predetermined voltage and a reference voltage in a third step, the input signals being supplied to an inverting input terminal of an operational amplifier constituting said integrator, a noninverting input terminal of said operational amplifier being connected to one terminal of a capacitor, and the other terminal of said capacitor being grounded; a comparator for comparing the predetermined voltage with an output voltage from said integrator and for generating a coincidence signal representing a coincidence between the two signals; and an automatic zero compensation circuit connected to an output terminal of said comparator only for a duration of the first step,

said automatic zero compensation circuit including: a first MOS transistor coupled between said output terminal of said comparator and said one terminal of said capacitor; an amplifier for substantially doubling a voltage at said one terminal of said capacitor; and a second MOS transistor which has the same physical configuration as said first MOS transistor and is coupled between said noninverting input terminal of said operational amplifier and an output terminal of said amplifier.

4,694,278

INTEGRABLE DECODING CIRCUIT

Hans P. Fuchs, Munich, and Jürgen R. Goetz, Oberneuching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 18, 1986, Ser. No. 908,829

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1985, 3533606

Int. Cl.⁴ H03M *7/00*

U.S. Cl. 340—347 DD **7 Claims**

1. Decoding circuit in CMOS technology for decoding information represented by input signals, comprising:

(a) first (VCC) and second (VSS) supply potential sources, an input for an individual input signal (A0), four further inputs for first and second input signals (A1, An) and input signals (A1, An) complementary thereto in pairs but not complementary to said individual input signal (A0), four decoder outputs (DA1 to DA4), two first connecting points (C,$\overline{C}$), and a last connecting point (A);

(b) first, second, third and fourth CMOS inverters (I1 to I4) each having: an output connected to a respective one of said decoder outputs (DA1 to DA4), a transistor of one

channel type having a source, a drain and a gate, and a transistor of the other channel type having a source, a drain and a gate;

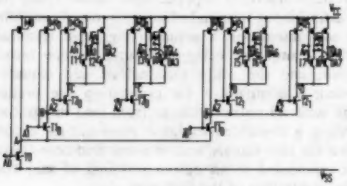
(c) the sources of said transistors of the one channel type in each CMOS inverter (I1 to I4) being connected to said first supply potential source (VCC);

(d) the sources of the transistors of the other channel type in said first and second CMOS inverters (I1,I2) being connected to each other and to one of said first connecting points (C) and the sources of the transistors of the other channel type in said third and fourth CMOS inverters (I3,I4) being connected to each other and to the other of said first connecting points ($\overline{C}$);

(e) two first switching transistors (T1, T1) of the other channel type each having a drain connected to a respective one of said first connecting points (C, $\overline{C}$), a source connected to each other and to said last connecting point (A), and a gate;

(f) the gate of one (T1) of said two first switching transistors (T1, T1) being connected to said input for said second input signal (A1) of said four further input signals (A1, An, A1, An) complementary to each other in pairs and the gate of the other (T1) of said two first switching transistors (T1, T1) being connected to said input for said input signal (A1) complementary to said second input signal (A1) of said four further input signals (A1, An, A1, An) complementary to each other in pairs;

(g) a last switching transistor (T0) of the other channel type having a drain connected to said last connecting point (A), a source connected to said second supply potential source



(VSS) and a gate connected to said input for said individual input signal (A0);

(h) the gates of both transistors of said first and third CMOS inverters (I1, I3) being connected to said input for said first input signal (An) of said four further input signals (A1, An, A1, An) mutually complementary in pairs and the gates of both transistors of said second and fourth CMOS inverters (I2, I4) being connected to said input for said input signal (An) complementary to said first input signal (An) of said four further input signals (A1, An, A1, An) mutually complementary in pairs: and

(i) further complementary transistors (M0, M1, M1) of the one channel type each having a drain connected to a respective one of said connecting points (A, C, $\overline{C}$), a source connected to said first supply potential source (VCC) and a gate connected to the gate of said switching transistor (T0, T1, T1) having the drain thereof connected to said respective connecting point (A, C, $\overline{C}$) to which the drain of said respective complementary transistor (M0, M1, M1) is connected.

2. Decoding circuit according to claim 1, wherein n is greater than 2, including:

(a) $2(n-2)$ further inputs for further input signals (A2) and input signals (A2) complementary thereto in pairs, 2^{n-1} further decoder outputs (DA5 to DA8); further first connecting points making a total of 2^{n-1} first connecting points (C, D, $\overline{C}$, $\overline{D}$), 2^{n-1} second connecting points (B, $\overline{B}$), and 2^{n-3} further connecting points including a last further connecting point;

(b) 2^{n-1} further CMOS Inverters (I5 to I8) each having an output connected to a respective one of said further decoder outputs (DA5 to DA8), a transistor of one channel type having a source, a drain and a gate, and a transistor of the other channel type having a source, a drain and a gate;

(c) the source terminals of the transistors of the other channel type of two (I5, I6) of said further CMOS inverters (I5 to I8) being connected to each other and to one (D) of said further first connection points (C, D, $\overline{C}$, $\overline{D}$), the source terminals of the transistors of the other channel type of two others (I7, I8) of said further CMOS inverters (I5 to I8) being connected to each other and to another ($\overline{D}$) of said further first connection points (D): and said further CMOS inverters (I5 to I8) being otherwise connected like said first four CMOS inverters (I1 to I4);

(d) further first switching transistors ($T2_0$, $T2_1$, $T2_0$, $T2_1$) of the other channel type each having a drain connected to a respective one of said first connecting points (C, D, $\overline{C}$, $\overline{D}$) and a source connected together with the source of another of said further first switching transistors to one of said second connecting points (B, $\overline{B}$);

(e) second switching transistors ($T1_0$, $T1_0$) of the other channel type each having a drain connected to a respective one of said second connecting points (B, $\overline{B}$) and a source connected to the source of another of said second switching transistors ($T1_0$, $T1_0$) and to one of said further connecting points;

(f) said switching transistors forming an alignment with said sources of each two of said switching transistors being interconnected $n-1$ times, at the end of said alignment said last connecting point (A) being connected to said last of said further connecting points, and between said first connecting points (C, D, $\overline{C}$, $\overline{D}$) a total of $n-1$ switching stages being formed through said second connecting points (B, $\overline{B}$) and said further connecting points up to said last connecting point (A);

(g) the gate of one ($T2_0$; $T2_1$) of said two first switching transistors ($T2_0$, $T2_1$; $T2_0$, $T2_1$) being connected to said input for said first signal (A2) of said 2^{n-2} further input signals (A2, A2) complementary to each other in pairs, and the gate of the other ($T2_0$, $T2_1$) of said two first switching transistors ($T2_0$, $T2_0$; $T2_1$, $T2_1$) being connected to said input for said input signal (A2) complementary to said first signal of said $2(n-2)$ further input signals (A2, A2) complementary to each other in pairs;

(h) in each switching stage with said further switching transistors, with the exception of said switching stage with said last switching transistor (T0), the gate of one of said two further switching transistors being connected to a further one of said inputs for said $2(n-2)$ further input signals (A2, A2) complementary to each other in pairs, and the gate of the other of said two further switching transistors being connected to an input for an input signal further to said further $2(n-2)$ input signals (A2,A2) complementary to each other in pairs: and

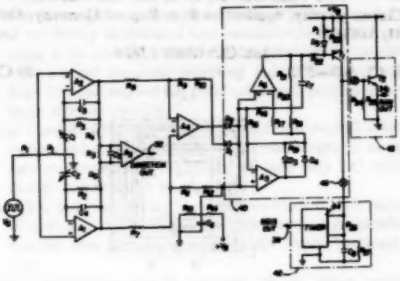
(i) additional complementary transistor ($M2_0$, $M2_1$, $M2_0$, $M2_1$, $M1_0$, $M1_1$, of the one channel type each having a drain connected to a respective one of said first connecting points (C, D, $\overline{C}$, $\overline{D}$), said second connecting points (B, $\overline{B}$) and said further connecting points, a source connected to said first supply potential source (VCC) and a gate connected to the gate of said switching transistor ($T2_0$, $T2_1$, $T2_0$, $T2_1$, $T1_0$, $T1_0$) having the drain thereof connected with said respective connecting point (C, D, /, $\overline{D}$, B, $\overline{B}$) to which the drain of said complementary transistor ($M2_0$, $M2_1$, $M2_0$, $M2_1$, $M1_0$, $M1_0$) is connected.

4,694,279

VECTOR ELECTRONIC CONTROL DEVICE

Frank Meno, Pittsburgh, Pa., assignor to University of Pittsburgh, Pittsburgh, Pa.

Filed Oct. 17, 1986, Ser. No. 920,123
Int. Cl.[4] H03M 1/00
U.S. Cl. 340—347 P 12 Claims



1. In an electronic device for generating at least two interrelated electrical outputs, comprising:

at least two capacitive sensing means each for establishing a capacitor with a grounded electrical conductor positionable to conduct a capacitance when said conductor contacts said sensing means, and said sensing means having a configuration such that its capacitance changes as the position of said grounded conductor changes;

a first generating means for generating a first electrical output of selected characteristics and strength in response to said change in capacitance imposed upon one or both of said sensing means including a difference determining means for deriving the difference in capacitance between said two sensing means, and said first electrical output representing this difference and defining the direction of the displacement of said grounded conductor on one or both of said sensing means; and

a second generating means for generating a second electrical output of selected characteristics and strength in a response to said change in capacitance imposed upon one or both of said sensing means, including a deriving and amplifying means for deriving and amplifying the difference in capacitance between said two sensing means; and

rectifying means for receiving said second electrical output and for generating a third electrical output defining the magnitude of said displacement of said grounded conductor on said one or both sensing means, whereby upon relative positioning and movement of said grounded member, the direction and magnitude of said output signals may be established.

4,694,280

KEYBOARD ENTRY SYSTEM

Philip E. Rollhaus, Chicago, Ill., and Yukio Endo, Thornton, N.H., assignors to Quixote Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 574,894, Jan. 30, 1984, Pat. No. 4,638,306. This application Apr. 25, 1986, Ser. No. 856,644
Int. Cl.[4] G06F 3/02; G08C 9/00
U.S. Cl. 340—365 R 22 Claims

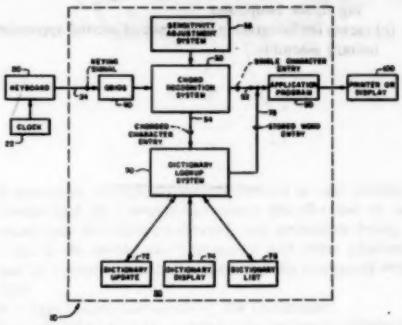
1. A keyboard entry system for a selected language, said system comprising:

a keyboard comprising a plurality of keys, said plurality of keys comprising a set of letter keys comprising a respective key for each letter of said selected language;

first means, responsive to the plurality of letter keys, for generating keying signals in response to activation of the letter keys, each keying signal characterized by a respective depression time when the keying signal is generated in response to depression of the respective letter key, and a respective release time when the keying signal is generated in response to release of the respective letter key;

second means, responsive to the first means, for generating output signals in response to the keying signals, said second means comprising:

means for classifying a plurality of keying signals as a key chord in the event the respective depression and release times satisfy predetermined criteria, said criteria comprising the component criterion that the elapsed time between a first one of the release times and an immediately preceding one of the depression times is greater than a preselected time interval;



means for storing a list of stored texts, each corresponding to a respective chord;

means, responsive to the key chord, for utilizing the key chord to select the one of the stored texts in the list of stored texts which corresponds to the key chord;

means for setting the output signal to correspond to the selected one of the stored texts; and

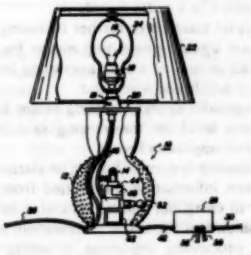
means for setting the output signal to correspond to the letters corresponding to the activated letter keys in the event the respective depression and release times fail to satisfy said criteria.

4,694,281

VISUAL ALARM APPARATUS

Julian A. McDermott, 1639 Stephen St., Ridgewood, N.Y. 11385; Jewel Verde, 2137 Hallmark Dr., Gambrille, Md. 21054, and Wayne McDermott, 2324 A E. 43 St., Apt. 5, Erie, Pa. 16510

Continuation of Ser. No. 418,932, Sep. 16, 1982, abandoned. This application Oct. 21, 1985, Ser. No. 789,754
Int. Cl.[4] G08B 19/00, 3/00
U.S. Cl. 340—521 13 Claims



1. An electrical lighting device, comprising:

(a) a first apparatus, responsive to switching control by an

attending person within a room, for general illumination of the space therein;

(b) a second apparatus, having means responsive to alert and alarm controls, for alerting and communication information to persons, should any be within said space, comprising:

a strobe lamp for producing high intensity flashes of light exceeding the level of intensity of said general illumination for said alerting and communicating information to persons, should any then be within said space; and

an enclosure for said strobe lamp comprising a partially globular shell of substantially transparent light transmitting material having a multiplicity of crystalline formations on a surface thereof for enhancement of said flashing strobe lamp; and

(c) means for integrating said first and second apparatus in an unitary assembly.

4,694,282

SECURITY MONITORING SYSTEM

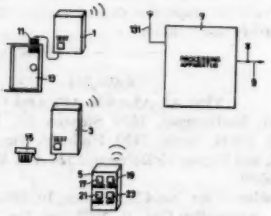
Hiroshi Tamura, and Yutaka Nakaie, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 11, 1985, Ser. No. 786,694

Claims priority, application Japan, Jan. 31, 1985, 60-017414

Int. Cl.[4] G08B *1/08*

U.S. Cl. 340—539 20 Claims



1. A security monitoring system, comprising:

(a) at least one radio transmitter which includes an alarm information transmission apparatus for transmitting alarm information as a radio signal;

(b) said radio transmitter further including

(1) a test signal transmitting means for transmitting test signals at one of a first amplitude level and a second lower amplitude level, and

(2) a manually operable setting means for setting a transmission level for transmitting said test signals at said second amplitude level;

(c) a processing apparatus having an alarm unit for receiving the alarm information transmitted from said radio transmitter to carry out alarm processing in accordance with the contents of the alarm information; and

(d) said processing apparatus including a first detecting means for detecting whether or not the system operates reliably by receiving the test signals having the second amplitude level.

4,694,283

IDENTIFICATION DEVICE IN THE FORM OF A TAG-LIKE STRIP AFFIXABLE TO AN ARTICLE

Max E. Reeb, Helfensteinstasse 7, D-7336 Uhingen, Fed. Rep. of Germany

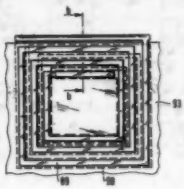
PCT No. PCT/DE82/00210, § 371 Date Jun. 29, 1983, § 102(e) Date Jun. 29, 1983, PCT Pub. No. WO83/01697, PCT Pub. Date May 11, 1983

PCT Filed Oct. 29, 1982, Ser. No. 513,970

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1981, 3143208

Int. Cl.[4] G08B *13/24*

U.S. Cl. 340—572 30 Claims



1. For use in electronic security systems, an identification device in the form of a tag-like strip containing a substantially planar resonant circuit comprising:

an inductive member and a capacitive member,

said inductive member and said capacitive member consisting of at least a first both inductively and capacitively reacting element and a second both inductively and capacitively reacting element being arranged in at least a first and a second plane, respectively,

said at least first both inductively and capacitively reacting element consisting of at least a first arrangement of flat conductor strips in said at least first plane,

said at least second both inductively and capacitively reacting element consisting of at least a second arrangement of flat conductor strips in said at least second plane,

said at least first and second both inductively and capacitively reacting elements being arranged in an aligned opposition, spaced one from another by at least one dielectric layer,

said at least one dielectric layer extending at least on mutually opposing surfaces of said at least first and second arrangements of flat conductor strips forming said at least first and second both inductively and capacitively reacting element, respectively,

said aligned opposition of said at least first and second both inductively and capacitively reacting elements providing an aligned overlay of said at least first and second arrangements of flat conductor strips such that any mutually opposing segments of at least first and second flat conductor path portions of said at least first and second arrangements of flat conductor strips

capacitively interact to a maximum extent with one another,

said at least first and second arrangements of flat conductor strips cooperating to form a coil having continuous turns of substantially uniform winding direction when viewed from one side of said planes,

said opposing segments of at least first and second flat conductor path portions spaced one from another by said at least one dielectric layer thus cooperating to form an individual LC stripline portion having a distributed line capacitance and a distributed line inductance,

said aligned overlay of said at least first and second arrangements of flat conductor strips thus representing the summed totality of all said individual LC stripline portions cooperating to form an LC circuit,

said cooperation of said individual LC stripline portions to form an LC circuit thus being realized by said at least first and second flat conductor strips being arranged in said at

least first and second respective planes and being spaced by said at least one dielectric layer forming a plurality of individual LC stripline loop portions,

said individual LC stripline loop portions being cascadingly stacked to form an LC stripline circuit construction exhibiting distributed line capacitances integrally summing to an overall effective capacitance owing to the surface areas of said mutually opposing at least first and second flat conductor strips and properties of said at least one dielectric layer spacing them one from another,

and exhibiting distributed line inductances integrally summing to an overall effective inductance owing to distributed mutual magnetic coupling factors between said at least first and second flat conductor path portion arranged in an aligned overlay,

said overall effective capacitance and said overall effective inductance and said distributed mutual magnetic coupling factors causing the capability of such said LC stripline circuit construction to resonate,

said LC stripline circuit construction formed by a plurality of individual LC stripline loop portions being cascadingly stacked thus forming a substantially planar resonant circuit,

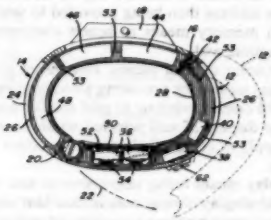
said substantially planar resonant circuit being provided with a suitable cover to form said tag-like strip.

4,694,284

ABDUCTION-PREVENTING COLLAR

Serge Leveille; Jacqueline Cormier, both of 5001-H rue des Bocages, St-Augustin, Canada G3A 1G4; Ginette Cormier, and Pierre Brassard, both of 723 Mohawk Rd. East, Hamilton, Canada (L8T 2P9)

Filed Apr. 14, 1986, Ser. No. 851,830
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—574 **8 Claims**



1. An abduction-preventing device comprising a collar adapted to surround a human body portion, said collar consisting of two legs pivoted one to the other at one end by a hinge member and releasably locked one to the other at the other end by a lock member, said legs being made of a shear-resistant material; a radio signal-transmitting circuit, an autonomous power supply for said circuit, and switching means to activate said circuit, all housed within said collar, and a switching means manual actuator accessible at the external face of said collar, said circuit further including means to prevent deactivation of said circuit once activated by said manual actuator, short of complete discharge of said power supply, while said lock member locks said legs around said body portion.

4,694,285

COMBINATION ELECTRICAL LIGHT, SMOKE AND/OR HEAT DETECTOR

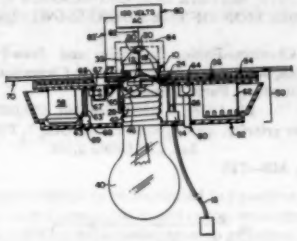
Keith A. Scripps, 4301 Massachusetts Ave., NW., Washington, D.C. 20016

Filed Nov. 12, 1985, Ser. No. 797,008
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—693 **2 Claims**

1. A combined and alternately selectible heat, smoke detector and electric light source for removable installation to an electric fixture comprising;

(A) electrically operable, combined smoke and heat sensor and alarm therefor, each being interconnected to the other;

(B) at least one illumination receptacle switchedly electrically interconnected to the smoke and heat sensor and alarm said illumination receptacle being recessed within the detector;



(C) connector electrically interconnected to said combined smoke and heat sensor and alarm therefor and to said receptacle in extension thereof; said connector being affixed to the smoke and heat sensor and alarm adjacently and in opposite orientation thereto in an integrated structure;

(D) a light source contained by the receptacle;

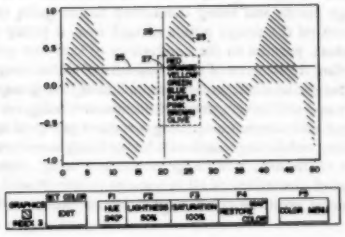
(E) an electrical power source for the elements aforesaid and wherein switching means is incorporated to energize and de-energize the power source.

4,694,286

APPARATUS AND METHOD FOR MODIFYING DISPLAYED COLOR IMAGES

Gar A. Bergstedt, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 8, 1983, Ser. No. 483,354
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—703 **7 Claims**



1. An apparatus for modifying color characteristics of a displayed color image formed by a plurality of pixels, the apparatus comprising:

means for storing pixel color data, including index values and sets of hue (H), lightness (L) and saturation (S) color values, each index value associating one color, represented by one set of H, L, S color values, with at least one pixel;

means for selecting a color of the image for modification by positioning a cursor at a specified pixel having that selected color; and

means for modifying at least one of the set of H, L, S color values associated with the specified pixel in response to input of new color data, said modifying means including a

means for inputting new color data for at least one of said set and a processor means responsive to the new color data for changing said at least one of the set of stored H, L, S color values to the new color data, enabling color modification, according to the modified set, of all pixels of the image having the same index value as the specified pixel.

4,694,287

ACTIVE MATRIX DISPLAY SCREEN WITHOUT INTERSECTION OF THE ADDRESSING COLUMNS AND ROWS

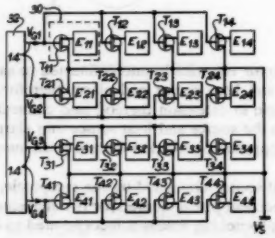
André Chenevas-Paule, Grenoble, and Jean-Frédéric Clerc, Meylan, both of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Oct. 5, 1984, Ser. No. 658,049

Claims priority, application France, Oct. 7, 1983, 83 15996

Int. Cl.⁴ G09G *3/34*

U.S. Cl. 340—719 **6 Claims**



1. An active matrix display screen incorporating a material whose optical characteristic can be modified, said material being inserted between a first wall and a second transparent wall, the screen comprising a plurality of image points arranged in a matrix of p rows and q columns, in which $1<p$ and $1<q$, each image point comprising a switching element and a first electrode on the first wall, said switching element being a thin film transistor whose drain is connected to said first electrode, and a second electrode on the second wall, wherein said screen comprising a first group of p row addressing conductors, each conductor being associated with a row of the matrix of image points and being connected to the gates of all the transistors of the image points of said row, a group of other conductors, parallel to the conductors of said first group and connecting the sources of the transistors of all the image points of the matrix to a reference potential, said first group of conductors and said other group of conductors being on the first wall, and said screen comprising a second group of q column addressing conductors, each conductor being associated with a column of the matrix of image points and being connected to the second electrodes of all the image points of said column, said second group of conductors being on the second wall.

4,694,288

MULTIWINDOW DISPLAY CIRCUIT

Munenori Harada, Sakai, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 5, 1984, Ser. No. 647,527

Claims priority, application Japan, Sep. 14, 1983, 58-170973

Int. Cl.⁴ G09G *1/16*

U.S. Cl. 340—721 **4 Claims**

1. A multiwindow display circuit comprising:

display means for displaying a plurality of display windows;

horizontal frame memory means for storing horizontal boundary data for each one of said plurality of display windows;

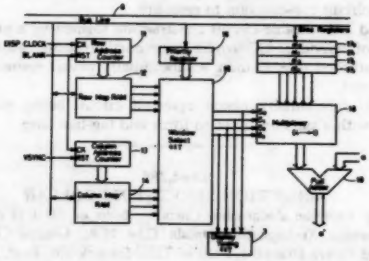
vertical frame memory means for storing vertical boundary data for each one of said plurality of display windows;

display address means for sequentially producing an initial address for each one of said plurality of display windows;

picture information memory means for storing picture information corresponding to each said initial address;

window selection means, responsive to said horizontal frame memory means and said vertical frame memory means, for selecting a particular display window from said plurality of display windows, said particular display window being selected when said initial address data is determined by said window selection means to be in said horizontal and vertical boundary data for said particular display window;

bias value memory means for storing a plurality of bias values for each one of said plurality of display windows, each one of said bias values representing the boundary data defined by said horizontal frame memory means and said vertical frame memory means of said window selection means;



address converter means for adding a selected one of said bias values corresponding to the selected display window to said initial address produced by said display address means to obtain a desired display address, said desired display address then being provided to said picture information memory means to access corresponding picture information; and

display timing control means, responsive to said window selection means, for providing a code representative of the selected display window to said display means for directing the display of said selected window, and controlling the supply of accessed picture information to said display means;

said display means being responsive to said code provided by said display timing means and said supplied picture information, whereby any portion of said picture information stored in said picture information memory means can be displayed on any display window of said display means.

4,694,289

DISPLAY MEMBER

Roger S. Kent, Duncraig, Australia, assignor to E.R.G. Management Services Pty., Ltd., Subiaco, Australia

PCT No. PCT/AU83/00177, § 371 Date Jul. 24, 1984, § 102(e) Date Jul. 24, 1984, PCT Pub. No. WO84/02414, PCT Pub. Date Jun. 21, 1984

PCT Filed Dec. 2, 1983, Ser. No. 634,156

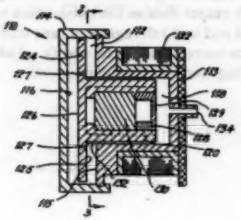
Claims priority, application Australia, Dec. 8, 1982, PF7176; May 24, 1983, PF9513

Int. Cl.⁴ G09G *3/34*

U.S. Cl. 340—815.05 **42 Claims**

1. A display member comprising a housing having a chamber filled with a fluid and having a viewing face, a reference member, means for mounting said reference member within said chamber for movement between a first position in which a front face of the reference member is in face to face contact with said viewing face and a second position in which said front face of the reference member is out of contact with the viewing face, said means for mounting further providing for effecting retention of said reference member in either of said

positions in the absence of the exertion of an external force, and drive means comprising a first magnetic device fixed relative to said housing and a second magnetic device fixed relative to said reference member, at least one of said magnetic devices being capable of being actuated to produce a driving force



between the said devices to selectively move said reference member between said first and said second positions, the respective densities of said fluid and said reference member cooperating to limit the retention provided by said means for mounting.

4,694,290

READINESS INDICATOR FOR LASER MEDICAL INSTRUMENTS

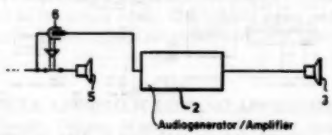
Jürgen Schwarz, Oberkochen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim on the Brenz, Fed. Rep. of Germany

Filed Feb. 7, 1985, Ser. No. 699,022

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1984, 3405308

Int. Cl.⁴ G08B *21/00*

U.S. Cl. 340—815.21 **6 Claims**



1. A device for indicating the readiness for operation of a laser medical instrument, said device comprising an audiogenerator and amplifier unit having an input and an output, an earphone operatively connected to said output, and an operative connection from an existing indicating device to said input of said unit, whereby a signal given by said existing indicating device will cause a signal to be delivered to said earphone.

4,694,291

DEVICE FOR TRANSMITTING A CLOCK SIGNAL ACCOMPANIED BY A SYNCHRONIZATION SIGNAL

Alain Denhez, Velizy-Villacoublay; Francis Hargoaa, Paris, and Jean Aubrée, Bougival, all of France, assignors to Alcatel, Paris, France

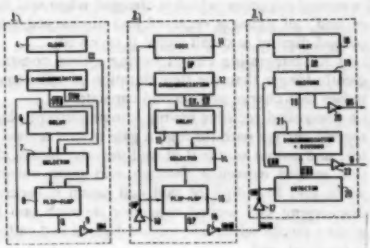
Filed Feb. 6, 1986, Ser. No. 826,648

Claims priority, application France, Feb. 7, 1985, 85 01723

Int. Cl.⁴ H04Q *1/00*

U.S. Cl. 340—825.2 **6 Claims**

1. Device for transmitting a clock signal accompanied by a synchronization signal, comprising a transmitter, a receiver adapted to deliver a clock signal and a synchronization signal to circuits connected to an output of said receiver, a link between said transmitter and said receiver and at least one repeater in said link, wherein said transmitter comprises a clock, a synchronization circuit, a flip-flop, a selector circuit, a delay circuit and an output inverter, said synchronization circuit has an input connected to said clock and first and second outputs connected to said selector circuit, said selector circuit has an input connected to a direct output of said flip-flop by said delay circuit and an output connected to a reset input of said flip-flop, and said flip-flop has a clock input connected to said



clock, a data input adapted to be connected to a positive potential and a direct output connected to said output inverter which delivers a clock and synchronization signal to an output of said transmitter.

4,694,292

DIGITIZED DECODER-RECEIVER FOR RECEIVING CALL SIGNAL

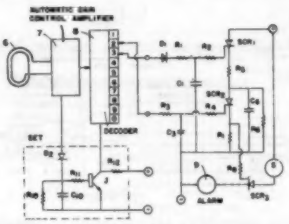
Kazumi Masaki, Osaka, Japan, assignor to Ken Hayashibara, Okayama, Japan

Filed Dec. 19, 1984, Ser. No. 683,476

Claims priority, application Japan, Jan. 12, 1984, 59-4081

Int. Cl.⁴ H04B *7/00*

U.S. Cl. 340—825.44 **4 Claims**



1. A portable device for receiving a transmitted call signal containing a first digit and a second digit, said call signal being an electromagnetic wave that carries a specific sequence of pulses having a first pulse and a last pulse, and having been preassigned as a decimal number to a particular person(s), comprising:

(a) a dc source for supplying power to said device;

(b) antenna means for picking up said call signal once it has been transmitted;

(c) an automatic gain control amplifier having an input terminal connected to said antenna means and at least one output terminal, said amplifier including means for converting said call signal, picked up by said antenna means, into a sequence of pulses;

(d) decoder means for counting the number of pulses in said sequence of pulses and activating a specific output in accordance with said number of pulses, said decoder means having a set/reset terminal and a first input terminal connected to said output terminal of said automatic gain control amplifier;

(e) a grounded-emitter transistor, having a base and a collector, for controlling said decoder means, said base of said transistor being connected to said output terminal of said automatic gain control amplifier and a first capacitor that cuts off said transistor at the end of said sequence of

pulses, and said collector of said transistor being connected to said set/reset terminal of said decoder means for initializing said decoder means when said first pulse of said sequence of pulses reaches said input terminal of said decoder means;

(f) a second capacitor which is charged when said first digit of said call signal is received and discharged when said second digit of said call signal is received;

(g) an RC-integrating circuit having a time constant sufficiently longer than the time duration of said sequence of pulses that charge said second capacitor;

(h) a controlled rectifier having a main current path and a second current path through a gate to said second capacitor, said output terminal of said decoder means charging said second capacitor through said main current path when said first digit of said call signal is received and discharging said second capacitor through said RCintegrating circuit when said second digit of said called signal is received; and

(i) means for alarming said particular person(s), said means for alarming being connected in series with said second capacitor so that when said second capacitor discharges, said means for alarming is activated.

4,694,293

DATA TRANSMISSION SYSTEM

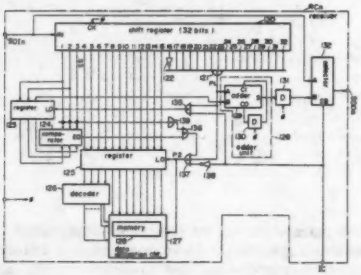
Jun Sugiyama; Kiyoshi Hagino, and Akira Usui, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 16, 1985, Ser. No. 776,689

Claims priority, application Japan, Sep. 18, 1984, 59-195573; Sep. 26, 1984, 59-200963

Int. Cl.⁴ H04Q *11/04*

U.S. Cl. 340—825.68 **14 Claims**



1. A data transmission system comprising:

(a) initialization signal generating means responsive to an application of power to said transmission system for producing an initialization signal;

(b) transmitter means connected to said initialization signal generating means and including initialization data generating means responsive to said initialization signal for generating initialization data of a predetermined value and a data output terminal for transmitting said initialization data via said output terminal; and

(c) first to Nth (N: integer greater than or equal to 2) receiver means which are connected in a cascade format in the ordinal number order and connected to said initialization signal generating means wherein said nth ($1 \leqq n \leqq N$) **receiver means comprises a nth input terminal, nth register means, nth modifying means and a nth output terminal;**

in said first receiver means, in response to said initialization signal, said first modifying means receiving said initialization data via said first input terminal, modifying said initialization data and delivering the modified initialization data as first output data via said first output terminal, and said first register means storing first identification data corresponding to said initialization data and identifying said first receiver means, and

in said kth ($2 \leqq k \leqq N$) **receiver means, in response to said initialization signal, said kth modifying means receiving a** $(k-1)$th output data via said kth input terminal, modifying said $(k-1)$th output data and delivering the modified $(k-1)$th output data as kth output data via said kth output terminal and said kth register means storing kth identification data corresponding to said $(k-1)$th output data and identifying said kth receiver means.

4,694,294

SYNCHRONIZED NETWORK SYSTEM

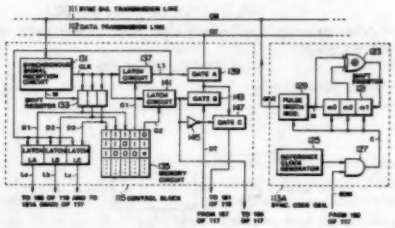
Tadashi Suzuki, Yokohama; Toru Futami, and Atsushi Sakagami, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jul. 10, 1985, Ser. No. 753,595

Claims priority, application Japan, Jul. 12, 1984, 59-144812

Int. Cl.⁴ H04Q *9/00*

U.S. Cl. 340—825.14 **11 Claims**



1. A network system including a data transmission line through which a serial data is transmitted, a synchronous signals transmission line through which a synchronous signal for controlling a transfer of the serial data is transmitted, and a plurality of data stations connected to both data transmission line and synchronous signal transmission line, each one of the data stations transferring the serial data to any of the other data stations in accordance with the synchronous signal, comprising:

(a) first means for generating and outputting the synchronous signal to the synchronous signal transmission line, the synchronous signals having information bits of a constant period for selecting any of the data stations between which the serial data is transferred via the data transmission line and with which the transfer of the serial data is synchronized;

(b) second means for cyclically generating said information bits of the synchronous signal;

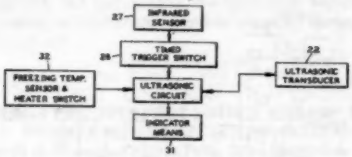
(c) third means for operatively inhibiting the transmission of said information bits to the synchronous signal transmission line; and

(d) fourth means responsive to the selection of any of the stations to transmit the serial data to the data transmission line by means of said information bits for actuating said third means to inhibit the transmission of said information bits to the synchronous signal transmission line over a period which is varied according to a length of the serial data transmitted to the data transmission line.

4,694,295
VEHICLE BLIND SPOT DETECTOR

Brett A. Miller, 2210 N. King Rd., Marion, Ind. 46952, and Daniel Pitton, 2046 NW. 43rd Ter., Apt. 1, Lauderhill, Fla. 33313

Filed May 15, 1986, Ser. No. 863,573
Int. Cl.[4] G08G *1/00*
U.S. Cl. 340—903 **9 Claims**



1. A vehicle blind spot detector for indicating to the driver of a first vehicle impending contact with another vehicle, the first vehicle comprising:

at least one infrared ranging circuit having an infrared light emitter and an infrared light detector for extended range sensing of reflected infrared light from said other vehicle converging from one side of said first vehicle, the detector being disposed externally on a corresponding side of the first vehicle, facing said other vehicle;

a timed trigger switch responsive to the infrared light detector for generating a delayed detector response after a given delay;

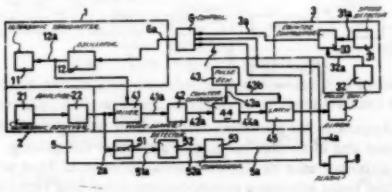
a short range ultrasonic ranging circuit responsive to the delayed detector response for ultrasonically measuring the distance to the other vehicle, disposed externally on a corresponding side of the first vehicle, facing said other vehicle;

an alarm operatively responsive to the ultrasonic ranging circuit for indicating potential contact with a converging vehicle to the driver of the first vehicle when said other vehicle is within a given range from the first vehicle.

4,694,296
VEHICLE APPROACH SENSING APPARATUS

Kunihiko Sasaki, Nukata; Masao Kodera, Okazaki, and Akira Kuno, Obu, all of Japan, assignors to Nippon Soken, Inc., Nishio and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Mar. 12, 1985, Ser. No. 711,046
Claims priority, application Japan, Mar. 13, 1984, 59-47661
Int. Cl.[4] G08G *1/00*; G01S *13/00, 15/93*
U.S. Cl. 340—904 **10 Claims**



1. A vehicle approach sensing apparatus installed in a first of two vehicles for detecting a condition wherein one vehicle is getting closer to another vehicle at an approach speed higher than a predetermined speed threshold, comprising:

ultrasonic transmission-reception means disposed in the one vehicle and which can be selectably started and stopped, for transmitting ultrasonic waves to the another vehicle in response to a drive signal fed thereto, and for then receiving the ultrasonic waves reflected from the another vehicle, and generating a reception signal which is varied in proportion with a strength of the received ultrasonic waves;

running speed detection means for detecting a running speed of the one vehicle and for starting said transmission-reception means when the detected running speed is decreased across a first threshold value and for stopping said transmission-reception means when said running speed detection means is increased across a second threshold value;

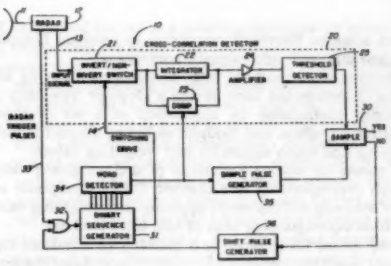
approach speed detection means for detecting an approach speed between the one and the another vehicles from the reception signal and for producing an alarm signal and simultaneously stopping said ultrasonic transmission-reception means when the detected approach speed is higher than the predetermined speed threshold; and

approach distance detection means for detecting an approach distance between the one and the another vehicles from the reception signal and stopping said ultrasonic transmission-reception means when the detected approach distance is shorter than a predetermined value.

4,694,297
REMOTE IDENTIFICATION DEVICE

Alan Sewards, Kanata, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Feb. 19, 1985, Ser. No. 703,236
Claims priority, application Canada, Feb. 27, 1984, 448362
Int. Cl.[4] G01S *13/78*
U.S. Cl. 342—45 **7 Claims**



1. An apparatus for distinguishing a moveable subject from a group of moveable subjects, comprising:

transmitting means for transmitting electromagnetic signals towards a remote area where the moveable subject to be identified is located, said transmitting means including a local receiving means;

remote receiving means for receiving said electromagnetic signals at said moveable subject to be identified, said moveable subject including an antenna;

impedance varying means including means for generating a remote predetermined binary sequence code for varying the terminating impedance of said antenna on said moveable subject wherein the scattering cross-section of said antenna to an incoming signal is a function of the match of the antenna to that signal such that a scattered reflected signal is produced, said reflected signal being modulated by variations of said impedance, said local receiving means receiving said reflected signal;

means for generating a local binary sequence code identical with said remote binary sequence code;

detecting means for detecting said reflected modulating signal at said local receiving means, said detecting means including means for cross-correlating said reflected signal modulated by said remote binary sequence code with said local binary sequence code, said cross-correlating means including an invert-noninvert switch receiving an input signal from said transmitting means and from said local binary sequence code generator, an integrator coupled to

said switch, an amplifier coupled to said integrator, and a threshold detector coupled to said amplifier;

a sample circuit coupled to said threshold detector providing an indication of the presence or non-presence of said remote binary sequence code; and

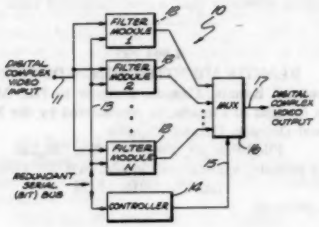
means for synchronizing said reflected and local coded signals.

4,694,298

ADAPTIVE, FAULT-TOLERANT NARROWBAND FILTERBANK

John M. Milan, Canoga Park, Calif., assignor to ITT Gilfillan, Van Nuys, Calif.

Filed Nov. 4, 1983, Ser. No. 548,607
Int. Cl.[4] G01S 7/40
U.S. Cl. 342—89 **15 Claims**



1. An adaptive filterbank responsive to received Doppler-modulated digitized video signals, comprising:

a plurality of narrowband filter modules each having an I and Q section and each having a Doppler frequency response controllable by application of a set of digital weighting values, said modules including means for multiplying said video signals by said weighting values;

first means for storing a plurality of said weighting values each corresponding to a discrete Doppler response and for selecting and discretely applying said weighting values within corresponding ones of said filter modules;

second means for generating a plurality of simulated digitized video test signals each Doppler-modulated at a set of discrete frequencies corresponding to the intended response of one of said modules;

third means for alternating the input signal of each of said modules between said received video signals and the corresponding one of said second means simulated video test signals; and

fourth means responsive to the output of each of said modules for continuously monitoring the Doppler frequency response thereof and for controlling the selection and application of corresponding ones of said weighting values to each of said modules.

4,694,299

PORTABLE RADAR SIMULATOR WITH ADJUSTABLE SIDE LOBE GENERATOR

William P. Huntley, Old Lyme, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

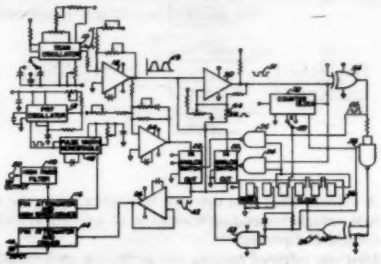
Filed Apr. 12, 1985, Ser. No. 722,542
Int. Cl.[4] G01S 7/40
U.S. Cl. 342—170 **3 Claims**

1. A portable radar simulator for generating a pulsed RF signal adapted to be provided to a directional microwave antenna comprising:

a scan oscillator for providing a sine wave signal;

shaping means for receiving said sine wave signal and for providing a plurality of electrical signals that simulate a main lobe and a side lobe on each side of said main lobe, said shaping means further comprises main lobe generation means connected to said scan oscillator for receiving said sine wave signals and for providing a main lobe at predetermined intervals, and side lobe generator means connected to said scan oscillator for receiving said sine wave signal and for providing a side lobe immediately prior to and immediately following said main lobe;

variable pulse width generator means for providng pulse signals;



modulating means for receiving said plurality of electrical signals simulating main lobe and side lobe on each side of said main lobe from said shaping means and an RF input signal and for providing a modulated RF signal; and

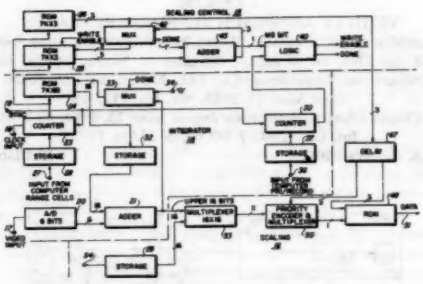
high speed driver means connected to receive said modulated RF signal and said pulse signals for providing a pulsed RF output.

4,694,300

APPARATUS FOR PROVIDING CONSTANT AZIMUTH CELLS IN AN AIRBORNE RADAR

Louis A. McRoberts, Scottsdale, and Arthur Felix, Jr., Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 14, 1983, Ser. No. 561,419
Int. Cl.[4] G01S 13/90
U.S. Cl. 342—195 **6 Claims**



1. Apparatus for providing azimuth cells having a relatively constant size in a radar beam, said apparatus comprising:

an airborne radar having a transmission beam of fixed width, said radar providing synchronizing pulses and video data;

integrating means coupled to said radar for dividing the radar beam into range bins and integrating the video data in each range bin in resonse to the synchronizing pulses, said integrating means including an analog to digital converter coupled to receive the video data from the radar and convert it to digital data signals, a random access memory for storing digital data signals and digital adder connected to add new and stored digital data signals and to supply the sum to the random acces memory for storage;

timing means coupled to said integrating means for dividing

the range bins into azimuth cells in accordance with the number of synchronizing pulses provided per unit distance of travel and controlling said integrating means to integrate the video data in each range bin over an entire azimuth cell; and

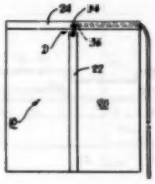
dividing means coupled to said integrating means for receiving summation signals representative of the sum of all of the digital data signals in each range bin for an entire azimuth cell and dividing the summation signals by the number of synchronizing pulses provided during the azimuth cell.

4,694,301

ANTENNA PARTICULARLY SUITED FOR USE WITH A MOBILE COMMUNICATIONS SYSTEM

Raymond E. Wassum, Chagrin Falls, Ohio, assignor to Antenna Incorporated - Div. of Celwave, Cleveland, Ohio

Filed Dec. 23, 1985, Ser. No. 812,528
Int. Cl.[4] H01Q *1/00, 1/38*
U.S. Cl. 343—720 **11 Claims**



1. An antenna suitable for mounting to a non-conductive flat surface comprising:

a planar substrate of electrically nonconducting material;

a first elongated rectangular conductor mounted to one side of the planar substrate and having a length for radiating electromagnetic energy of a predetermined frequency range in response to a radio signal and for receiving electromagnetic energy of said predetermined frequency range for conversion to a radio signal;

a second elongated ground plane conductor mounted to said one side of the planar substrate, oriented at a right angle to said first conductor, and having a mid-portion spaced from one end of the first elongated conductor; and

cable means having a radio signal carrying conductor coupled to the first elongated conductor and a ground conductor coupled to the second elongated conductor;

said ground plane mid-portion spaced from the one end of said first conductor for impedance matching the cable means to said antenna.

4,694,302

REACTIVE INK-JET PRINTING

David E. Hackleman, Monmouth, and Norman E. Pawlowski, Corvallis, both of Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 6, 1986, Ser. No. 871,346
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—1.1 **30 Claims**

1. A method of improving the water fastness of an ink on a substrate employing ink-jet printing comprising:

(a) providing said substrate;

(b) providing an ink-jet print head having at least a first set of nozzles connected to a first reservoir;

(c) providing an ink composition comprising a coloring agent and a vehicle and at least one reactive species capable of reacting with a second species to form a polymer on said substrate, said polymer binding said coloring thereto, said second species comprising either a component in said substrate or a component maintained in a second reservoir, separate from said first reservoir and associated with a second set of nozzles indexed with said first set of nozzles; and

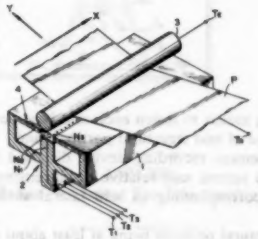
(d) applying either said ink or said ink and said second component separately to said substrate to form said polymer thereon.

4,694,303

METHOD AND APPARATUS FOR PRINTING IMAGE

Tetsuro Morino, and Shigeki Yamashita, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 611,364, May 16, 1984, abandoned. This application Jan. 31, 1986, Ser. No. 824,925
Claims priority, application Japan, May 24, 1983, 58-91130
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—1.1 **6 Claims**



1. A method for use in a printing apparatus for image printing, comprising the steps of:

submerging in ink a continuous uniform block of insulation material containing printing electrodes which are formed by linearly arranging and closely and uniformly spacing a plurality of styli in a line so that the end portions of said styli, which terminate substantially coplanarly with the top of said insulation block, are slightly below an ink surface, said block having no coplanar electric field producing electrodes; said submerging step further including the step of placing on said ink surface a covering containing an elongated opening, said ink surface forming a meniscus at said opening, said opening traversing the entire line of said printing electrodes;

confronting said printing electrodes by an auxiliary electrode opposite to said printing electrodes and slightly above said ink surface; and

raising the level of desired portions of said ink surface, without the use of electroosmotic force, by applying a voltage across said printing electrodes and said auxiliary electrode in accordance with information of an image to be printed so as to print onto a printing medium disposed slightly above said ink surface, which is sufficiently close so that upon applying said voltage said risen ink touches the paper medium, wherein said image is printed on said printing medium with said ink.

4,694,304

EARTHQUAKE DISPLACEMENT RECORDER

Paul D. Engdahl, 2930-E Grace La., Costa Mesa, Calif. 92626

Filed Aug. 13, 1986, Ser. No. 896,090
Int. Cl.[4] G01D *9/00*
U.S. Cl. 346—7 **11 Claims**

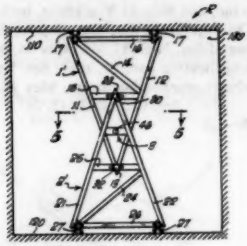
1. An instrument for recording generally lateral shear-like vibrational displacements between a first and a second structural portion of a structure, said displacements being generally perpendicular to a line joining said structural portions, comprising:

a first and a second generally flat triangular displacement-transmitting member, each having a base portion and an apex portion;

said members being disposed in adjacent parallel planes with

their base portions spaced and parallel and facing outward, and their apex portions facing inward and overlapping each other to define an overlap area;

sliding joint means in said overlap area disposed to hold said members together but to permit relative sliding displacement in their own planes along a direction parallel to said base portions;



mounting means to fasten each said base portion to a separate one of said structural portions, and

a displacement recording device disposed in said overlap area to record said relative displacement, said displacement corresponding to said lateral shear-like displacement;

said structural portions being at least about a meter apart.

4,694,305

MULTI-COLORED STACKED CASSETTES THERMAL PRINTER

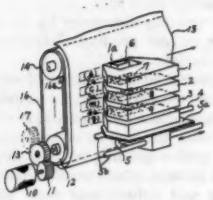
Kengo Shiomi, Tokyo; Yoshiyuki Sasaki, Chofu, and Toshiyuki Kato, Tokyo, all of Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1986, Ser. No. 846,590

Claims priority, application Japan, Mar. 30, 1985, 60-67574; Mar. 30, 1985, 60-67575

Int. Cl.[4] G01D *15/10;* **B41J** *35/14*

U.S. Cl. 346—76 PH **7 Claims**



1. A multi-chromatic thermal printer which comprises:

recording substrate supply means for introducing a recording substrate into an image receiving position of said thermal printer;

a carriage means for laterally traversing said recording substrate;

a plurality of ribbon cassette members positioned in vertical array on said carraige means, each of said ribbon cassette members having an ink ribbon disopsed for contact with sasid recording substrate, said ribbon formed with a pigment-containing material;

a plurality of thermal head members positioned on said carriage means for selectively cooperating with a ribbon cassette member of said plurality of ribbon cassette members, each of said thermal head members being capable of being heated in image-wise pattern; and

transfer means for cooperating with said plurality of thermal head members to thereby heat said respective ribbon in said image-wise pattern and to transfer said thus heated pattern onto said recording substrate.

4,694,306

LIQUID JET RECORDING HEAD WITH A PROTECTIVE LAYER FORMED BY CONVERTING THE SURFACE OF A TRANSDUCER INTO AN INSULATING MATERIAL

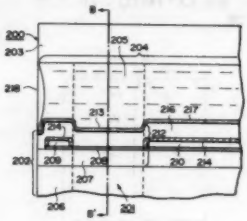
Masami Ikeda, Machida; Hiroto Matsuda, Ebina; Hiroto Takahashi, and Tatsumi Shohji, both of Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 575,678, Jan. 31, 1984, abandoned. This application May 20, 1986, Ser. No. 867,890

Claims priority, application Japan, Feb. 5, 1983, 58-16900

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R **4 Claims**



1. A liquid jet recording head comprising:

a liquid discharging portion having an orifice for discharging liquid to form flying liquid droplets and a heat acting zone communicating with said orifice at which heat energy for forming said liquid droplets can act on the liquid therein, and

an electrothermal transducer including at least a pair of confronting electrodes connected electrically to a heat generating resistance layer provided on a substrate to form a heat generating portion between said electrodes and a protective layer formed by a reaction that converts material comprising said electrothermal transducer into an insulating inorganic material, wherein said reaction comprises at least one of oxidation, nitriding, boriding and carbiding of said electrothermal transducer at the surface thereof to convert said surface into at least one of an oxide, a nitride, a boride and a carbide, respectively, of the material comprising electrothermal transducer.

4,694,307

RECORDING DEVICE WITH MULTIPLE RECORDING UNITS AND A COMMON INK SOURCE

Shigeo Toganoh; Yohji Matsufuji, and Hiroo Ichihashi, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 752,474, Jul. 3, 1985, abandoned, which is a continuation of Ser. No. 419,515, Sep. 17, 1982, abandoned. This application Jun. 9, 1986, Ser. No. 873,837

Claims priority, application Japan, Oct. 2, 1981, 56-157296; Oct. 2, 1981, 56-157303

Int. Cl.[4] G01D *15/16;* **B41J** *3/54*

U.S. Cl. 346—140 R **1 Claim**

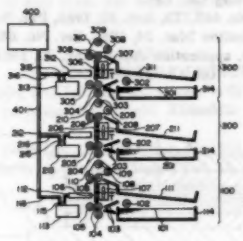
1. A recording device comprising:

a plurality of ink-jet recording units arranged separately from each other, each of said recording units including a plurality of multi-nozzle ink-jet recorder heads having aligned nozzles;

a plurality of ink feeders, each corresponding to one of said

recording units, for supplying ink to said recorder heads of said corresponding recording unit;

a single main ink reservoir for containing ink; and



means for supplying ink from said single main ink reservoir to all of said ink feeders.

4,694,308

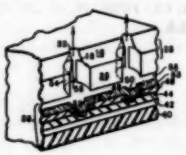
BARRIER LAYER AND ORIFICE PLATE FOR THERMAL INK JET PRINTHEAD ASSEMBLY

C. S. Chan, and Robert R. Hay, both of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 801,169, Nov. 22, 1985, abandoned. This application Dec. 4, 1986, Ser. No. 939,284

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R 17 Claims



13. In a thermal jet printhead assembly including a plurality of resistor heater elements within a thin film resistor structure and further having a plurality of individual ink reservoirs constructed atop and aligned with respect to the plurality of resistive heater elements, respectively, for receiving thermal energy therefrom during an ink jet printing operation, the improvement comprising: a barrier layer and orifice plate structure including a barrier layer having cavities therein defining ink reservoirs, said cavities aligned with respect to said heater resistors and further having ink flow ports therein for receiving ink from an ink source, and an orifice plate layer joined to said barrier layer and having ink passageways therein aligned with respect to said cavities in said barrier layer, said ink passageways being defined by contoured and curved interior walls which converge from a point of maximum diameter adjacent said barrier layer to a point of minimum diameter at the outer surface of said orifice plate layer, whereby the convergent geometry of said passageways minimizes turbulance, air gulping, and cavitation wear caused by ink flowing through said passageways.

4,694,309

Patent Not Issued For This Number

4,694,310

METHOD AND APPARATUS OF ELECTROPHOTOGRAPHY

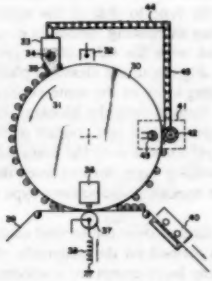
Tutomu Saito, and Hitoshi Yoneda, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 10, 1984, Ser. No. 648,819

Claims priority, application Japan, Sep. 19, 1983, 58-172569; Sep. 19, 1983, 58-172570

Int. Cl.[4] G01D *15/14*

U.S. Cl. 346—153.1 11 Claims



1. A method of electrophotography, which comprises:

charging a photoconductive layer, in a photoreceptor consisting of a transparent, electrically conductive layer and said photoconductive layer which is sequentially formed on a transparent substrate, with a polarity;

applying a toner charged with a polarity opposite to that of

said photoconductive layer on a surface of said photoconductive layer;

exposing a portion of said photoconductive layer with said toner thereon from one side of said transparent substrate and making a charge on an exposed region of said photoconductive layer disappear through said transparent conductive layer; and

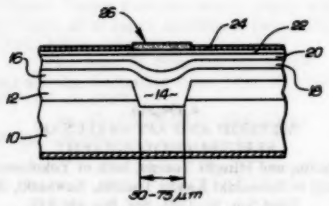
transferring toner particles on the exposed region of said photoconductive layer to toner-receiving paper held between said photoconductive layer and an electrode opposing said photoconductive layer, by applying to said electrode a voltage having a polarity opposite to that of said toner.

4,694,311

PLANAR LIGHT-EMITTING DIODE

Edward A. Rezek, Redondo Beach, and Andre Burghard, Torrance, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 736,880, May 22, 1985, Pat. No. 4,647,320. This application Sep. 11, 1986, Ser. No. 906,005
Int. Cl.⁴ H01L *33/00*
U.S. Cl. 357—17 **3 Claims**



1. A light-emitting diode of the surface emitting type, comprising:

a substrate of a selected material that is anisotropic;

a blocking layer formed over the substrate and of opposite conductivity type to that of the substrate, the blocking layer having an opening formed in it, of rectangular cross section and with the sides of the rectangle oriented at forty-five degrees to the cleavage planes of the substrate;

a first cladding layer of the same conductivity type as the substrate, formed over the blocking layer and extending into the opening and into contact with the substrate;

an active layer formed over the first cladding layer;

a second cladding layer formed over the active layer and having an opposite conductivity type to that of the substrate;

a cap layer formed over the second cladding layer;

metal layers formed on the underside of the substrate and over the cap layer except for a selected area immediately over the opening in the blocking layer; and

an anti-reflection coating formed over the device immediately over the opening in the blocking layer;

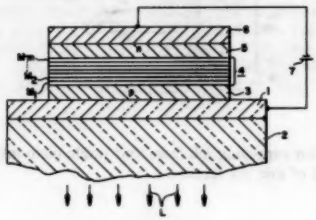
whereby the diode provides a light emission pattern that is rectangular, and the formation of the opening exposes no anisotropic crystal planes that could inhibit normal growth in subsequent fabrication steps.

4,694,312

NON-SINGLE-CRYSTAL SEMICONDUCTOR LIGHT EMITTING DEVICE

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd.

Division of Ser. No. 645,773, Aug. 30, 1984, Pat. No. 4,616,244. This application Mar. 24, 1986, Ser. No. 843,099
Claims priority, application Japan, Aug. 30, 1983, 58-160026
Int. Cl.⁴ H01L *33/00*
U.S. Cl. 357—17 **7 Claims**



1. A non-single-crystal semiconductor light emitting device comprising:

a substrate;

a first electrode formed on said substrate;

a first non-single-crystal semiconductor layer of a first conductivity type, formed on said first electrode and making ohmic contact therewith;

a non-single-crystal semiconductor intrinsic region formed in layers on said first non-single-crystal semiconductor layer;

a second non-single-crystal semiconductor layer of a second conductivity type reverse from the first conductivity type of the first non-single-crystal semiconductor layer formed on said non-single-crystal semiconductor intrinsic region; and

a second electrode formed on said second non-single-crystal semiconductor layer and making ohmic contact therewith;

wherein said non-single-crystal semiconductor intrinsic region is formed by a non-single-crystal semiconductor laminate member made up of a plurality m (where m 3) of third non-single-crystal semiconductor layers M_1, M_2, . . . and M_m sequentially laminate in this order, and

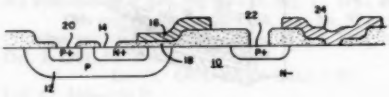
wherein the energy gaps Eg_1, Eg_2, . . . and Eg_m of said third non-single-crystal semiconductor layers M_1, M_2, . . . and M_m bear such relationships as $Eg_1 > Eg_2 < Eg_3$, $Eg_3 > Eg_4 < Eg_5$, . . . $Eg_{(m-2)} > Eg_{(m-1)} < Eg_M$.

4,694,313

CONDUCTIVITY MODULATED SEMICONDUCTOR STRUCTURE

James D. Beasom, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Feb. 19, 1985, Ser. No. 702,601
Int. Cl.⁴ H01L *29/48, 29/78, 27/02*
U.S. Cl. 357—23.4 **33 Claims**



1. An insulated gate field effect transistor comprising:

source and drain regions of a first conductivity type separated by a body region of a second conductivity type;

a gate over a portion of said body region between said

source and drain regions and separated from said body by an insulation layer; and

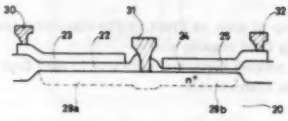
a minority carrier diode and a majority carrier diode both formed with said drain region in series with a PN junction formed by said drain and body regions.

4,694,314

SEMICONDUCTOR DEVICE

Yasushi Terada, and Takeshi Nakayama, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1985, Ser. No. 811,884
Claims priority, application Japan, Jan. 18, 1985, 60-7719
Int. Cl.⁴ H01L *29/78*
U.S. Cl. 357—23.6 **6 Claims**



1. A semiconductor device forming a programming high-voltage pulse signal generator in an electrically erasable and programmable read-only memory device comprising data storage means including a plurality of memory transistors, each of said memory transistors comprising a semiconductor substrate, a control electrode, a floating gate for storing and emitting electric charge according to the voltage applied to said control electrode and a tunnel oxide film formed between said floating gate and said semiconductor substrate to serve as a path for electric charge, said high-voltage pulse signal generator comprising reference voltage generating means for generating a voltage signal serving as a reference of voltage for a high-voltage pulse generated by said high-voltage signal pulse generator, means for receiving the signal from said reference voltage generating means and providing a signal having a gentle rise to control the rise of said high-voltage pulse, and means for programming said data storage means using said high-voltage pulse signal generator, said means for receiving the signal including:

a switched-capacitor equivalent to a resistor including a first capacitor having a first grounded electrode and means for electrically switching a second electrode of said first capacitor between said reference voltage generating means and said programming means, and

a second capacitor formed of an oxide film having a thickness corresponding to the thickness of said tunnel oxide film, said capacitor connected in parallel to said programming means.

4,694,315

CMOS OVERVOLTAGE PROTECTION CIRCUIT UTILIZING THYRISTOR AND MAJORITY CARRIER INJECTING ANTI-PARALLEL DIODE

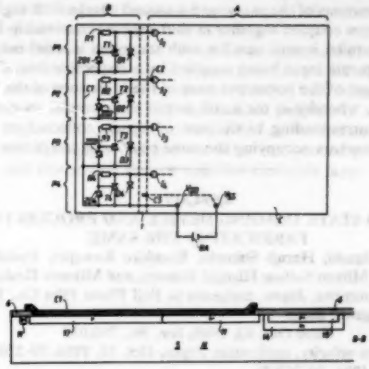
Per Svedberg, Vällingby, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Feb. 26, 1986, Ser. No. 832,786
Claims priority, application Sweden, Feb. 26, 1985, 8500924
Int. Cl.⁴ H01L *29/78*
U.S. Cl. 357—23.13 **12 Claims**

1. A semiconductor device comprising:

a CMOS type semiconductor circuit having a substrate, a contact electrically connected to the substrate and at least two inputs;

an overvoltage protective circuit formed in the substrate, the overvoltage protective circuit providing for each input an antiparallel array of a thyristor and a diode, the array being connected between the respective input and the contact, each thyristor being turned on at a voltage level predetermined internally by the overvoltage protective circuit; each thyristor having in succession a first emitter layer, a first base layer, a second base layer and a second emitter layer, the substrate constituting one of the base layers; each diode having an anode contact and a cathode contact, one of the contacts electrically communicating with the substrate and injecting thereto charge carriers of the same type as the majority charge carriers in the substrate when current flows through the diode; the CMOS circuit and the overvoltage protective circuit being arranged adjacent to each other in the substrate; and



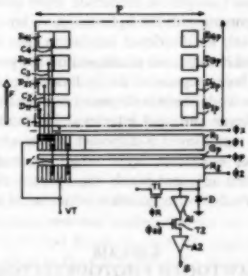
a zone formed in the substrate for separating the CMOS circuit and the overvoltage protective circuit, the zone having means for reducing the concentration of minority charge carriers in the substrate.

4,694,316

MULTILINEAR CHARGE TRANSFER ARRAY AND ANALYSIS PROCESS

Jean J. Chabbal, St. Egreve, France, assignor to Thomson-CSF, Paris

Filed May 7, 1985, Ser. No. 731,554
Claims priority, application France, May 18, 1984, 84 07761
Int. Cl.⁴ H01L *29/78, 27/14, 31/00*
U.S. Cl. 357—24 **24 Claims**



1. An imaging system operable in a time delay integration mode comprising a multilinear array of photodetectors in N rows, each including a set of P photodetectors, means including a plurality of charge transfer shift register for in-phase summing of the N signals detected in the photodetector at the corresponding position in the row for each of the N rows,

means for transferring the signals detected to the shift registers, the plurality of shift registers including a first shift register having P separate sections one for each of the P positions in each row, each section including N stages coupled together in shift register relationships, each stage being supplied by way of the transferring means by a separate photodetector the N stages of each section being supplied by the N photodetectors of corresponding position of the array, wherein each section effects the time-delay integration of the N signals for each of the P positions of the array, and a second charge shift register of P stages coupled together in shift register relationship having P parallel inputs, one for each stage and a serial output, each separate input being supplied by a respective one of the Nth stages of the respective ones of the P sections of the first register, whereby at the serial output there results an output signal corresponding to the sum of signals collected on the photodetectors occupying the same position in the N rows.

4,694,317

SOLID STATE IMAGING DEVICE AND PROCESS FOR FABRICATING THE SAME

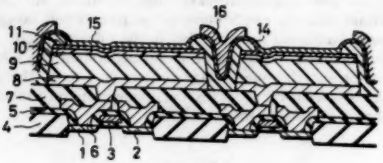
Akio Higashi; Haruji Shinada; Kazuhiro Kawajiri; Yoshihiro Ono; Mitsuo Saitou; Hiroshi Tamura, and Mitsuru Ikeda, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 22, 1985, Ser. No. 790,015

Claims priority, application Japan, Oct. 22, 1984, 59-220547; Dec. 7, 1984, 59-257686

Int. Cl.[4] H01L *45/00, 27/14, 29/06, 23/48*

U.S. Cl. 357—30 **5 Claims**



1. In a solid-state imaging device that comprises stated order, a circuit for scanning a plurality of pixels, a light-sensitive film and a transparent electrode layer, said plurality of pixels being defined by a plurality of electrodes on said semiconductor substrate and said transparent electrode layer, the improvement wherein said light-sensitive layer is separated for individual pixels, a first transparent electrode layer covers, and is in substantial alignment with the light-sensitive layer corresponding to each pixel, an interlevel insulation film is disposed in grooves that isolate adjacent pixels and on the periphery of the light-sensitive layer separated for individual pixels, a second transparent electrode layer is disposed over said first transparent electrode layer and said interlevel insulation film, and a light-shielding metal layer is disposed in that area of said second transparent electrode layer which corresponds to the isolation between adjacent pixels. transparent electrode layer which corresponds to the isolation between adjacent pixels.

4,694,318

SAWTOOTH PHOTODETECTOR

Federico Capasso, Westfield, and Won-Tien Tsang, New Providence, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

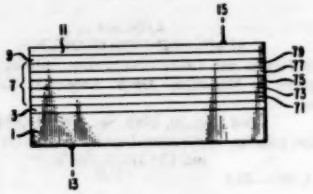
Filed Dec. 5, 1984, Ser. No. 678,226

Int. Cl.[4] H01L *27/14, 31/00*

U.S. Cl. 357—30 **11 Claims**

1. In a photodetector comprising first and second substrate-supported regions, said first and second regions having a first conductivity type,

a plurality of varying field regions between said first and second regions, said first and second regions having a



bandgap at least as great as the smallest bandgap in said varying field region, and

first and second electrical contacts to said first and second regions, respectively.

4,694,319

THYRISTOR HAVING A CONTROLLABLE GATE TRIGGER CURRENT

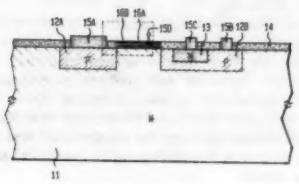
Teruo Kusaka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 21, 1984, Ser. No. 612,668

Claims priority, application Japan, May 19, 1983, 58-88001

Int. Cl.[4] H01L *29/74, 29/52, 29/78, 29/40*

U.S. Cl. 357—38 **9 Claims**



1. A thyristor comprising:

a semiconductor substrate of one conductivity type;

first and second regions of another conductivity type formed in said semiconductor substrate, said first and second regions being separated by an interval between 50 and 60 μm;

a third region of said one conductivity type formed in said second region;

a first conductive layer formed on but electrically isolated from a portion of said substrate positioned between said first and second regions, said first conductive layer being kept in an electrically floating condition;

a second conductive layer formed on but electrically isolated from said first conductive layer;

means for applying a voltage to said second conductive layer; and

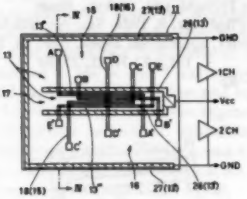
a first electrode connected with said first region, a second electrode connected with said second region and a third electrode connected with said third region.

4,694,320

SEMICONDUCTOR INTEGRATED CIRCUIT HAVING MULTIPLE-LAYERED CONNECTION

Tetsuro Asano, Gunma, Japan, assignor to Sanyo Electric Co., Japan

Continuation of Ser. No. 714,719, Mar. 21, 1985. This application Aug. 7, 1986, Ser. No. 894,381
Claims priority, application Japan, Mar. 29, 1984, 59-62494; Mar. 29, 1984, 59-62495; Mar. 29, 1984, 59-62496
Int. Cl.[4] H01L *27/02, 23/48, 29/44, 29/52*
U.S. Cl. 357—40 14 Claims



1. A semiconductor integrated circuit having a multiple-layered connection, comprising:

a semiconductor substrate having a main surface divided into first and second regions, said first region including first and second portions, said second region both including first and second sides and being rectangularly shaped;

said first portion being formed outside of and adjacent to said first side;

said second portion being formed outside of and adjacent to said second side,

integrated circuit elements formed in said first and second portions of said first region,

a first insulating layer covering said main surface of said semiconductor substrate,

a first electrode layer formed on said first insulating layer and including connection runs,

a first portion of said connection runs of said first electrode layer extending in said first and second portions of said first region, at least a part of said first portion of said connection runs of said first electrode layer being connected through said first insulating layer to said integrated circuit elements,

a second portion of said connection runs of said first electrode layer extending in said second region, said second portion of said connection runs being of the number necessary for cross connections being formed concentratedly in said second region,

a third portion of said connection runs of said first electrode layer constituting a voltage supply line and extending between said first region and said second region, such that said second portion of said connection runs in said second region is surrounded by said voltage supply line, while said voltage supply line extends to face said first and second portions of said first region of said main surface of said semiconductor substrate for connection to said integrated circuit elements, said voltage supply line being disposed in a U-shaped configuration including two parallel line elements, the distance between the said two line elements being selected such that any necessary ones of said connection runs may be formed in the whole of said second region, said line elements being electrically connected together at like first ends via a bridging element, at least one bonding pad being electrically connected to said bridging element, and said line elements being electrically isolated between like second ends;

a second insulating layer covering said first insulating layer and said first electrode layer, and

a second electrode layer formed on said second insulating layer and including connection runs extending between said first and second regions across and above said voltage supply line, at least a portion of said connection runs of said second electrode layer in said first regions being connected through said second insulating layer to said connection runs of said first portion of said first electrode layer in said first and second portions of said first region of said main surface of said semiconductor substrate and being connected through said second insulating layer to said connection runs of said second portion of said first electrode layer in said second region of said main surface of said semiconductor substrate;

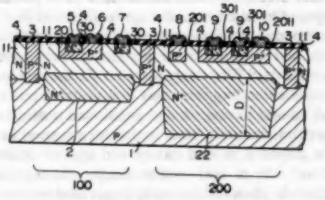
whereby said integrated circuit elements connected through said first portion of said connection runs of said first electrode layer to said connection runs of said second electrode layer in said first and second portions of said first region are connected to each other across and above said voltage supply line and via either said second portion of said connection runs or said first electrode layer.

4,694,321

SEMICONDUCTOR DEVICE HAVING BIPOLAR TRANSISTOR AND INTEGRATED INJECTION LOGIC

Katsuyoshi Washio; Makoto Hayashi, both of Hachioji; Tomoyuki Watanabe, Tokyo; Takahiro Okabe, and Katuhiro Norisuye, both of Kodaira, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering, Ltd., both of Tokyo, Japan

Filed Jul. 17, 1985, Ser. No. 755,912
Claims priority, application Japan, Jul. 18, 1984, 59-147535
Int. Cl.[4] H01L *27/04;* H03K *19/091*
U.S. Cl. 357—48 7 Claims



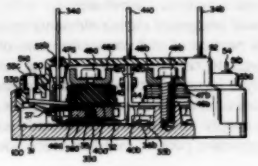
1. A semiconductor integrated circuit device incorporating an integrated injection logic (IIL) and an integrated circuit including a bipolar transistor, comprising a semiconductor substrate of a first conductivity type; a semiconductor layer of a second conductivity type formed over said substrate and defining an IIL region and a bipolar transistor region; a plurality of buried layers of the second conductivity type more heavily doped than said semiconductor layer embedded between said substrate and said semiconductor layer, wherein the top surface of a buried layer for said IIL region has substantially the same level as the top surface of a buried layer for said bipolar transistor region, the top surface of each buried layer being defined as the location where the concentration of doping of second conductivity type has decreased to substantially the concentration of said layer; and said buried layer for the IIL region having a thickness larger than that of said buried layer for the bipolar transistor region to such an extent that carriers of the first conductivity type do not reach said substrate.

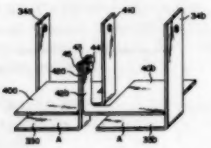
4,694,322

PRESS-PACKED SEMICONDUCTOR DEVICE

Hiroshi Sakurai, Kawasaki, and Masami Iwasaki, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Sep. 13, 1984, Ser. No. 650,107
Claims priority, application Japan, Sep. 29, 1983, 58-181284; Sep. 29, 1983, 58-181286
Int. Cl.[4] H01L *23/02, 23/44, 25/04, 21/447*
U.S. Cl. 357—74 **15 Claims**





1. A press-packed semiconductor device, comprising:

a. a heat-discharging support member having a mounting surface;

b. a lid disposed on said support member and defining a cavity therebetween;

c. a press-packed semiconductor element disposed in said cavity and having first and second sides, a first electrode contact positioned on said first side, and second and third electrode contacts positioned on said second side, said semiconductor element being spaced-apart from said mounting surface of said support member with one of said sides facing said mounting surface;

d. a first electrode plate including a first pressing portion disposed in said cavity and contacting said first side of said semiconductor element to form an electrical connection with said first electrode contact of said semiconductor element, said first electrode plate further including a lead portion extending from said first pressing portion through said lid and having an end positioned outside said cavity;

e. a second electrode plate including a second pressing portion disposed in said cavity and spaced apart from said second side of said semiconductor element, said second electrode plate further including a lead portion extending from said second pressing portion through said lid and having an end positioned outside said cavity;

f. a conducting plate disposed between said second side of said semiconductor element and said second pressing portion of said second electrode plate to form an electrical connection between said second electrode contact of said semiconductor element and said second electrode plate, said conducting plate including a through hole positioned at said third electrical contact of said semiconductor element;

g. a lead wire extending through said through hole of said conducting plate and having an end portion contacting said third electrical contact of said semiconductor element to form an electrical connection between said lead wire and said third electrode contact;

h. first pressing means for elastically pressing together said pressing portions of said first and second electrode plates to maintain said electrical connections between said first electrode contact of said semiconductor element and said first electrode plate and between said second electrode contact of said semiconductor element and said second electrode plate; and

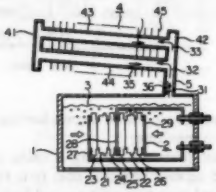
i. second pressing means for elastically pressing said end portion of said lead wire toward said third electrode contact of said semiconductor element to maintain said electrical connection between said lead wire and said third electrode contact.

4,694,323

APPARATUS FOR VAPOR-COOLING A SEMICONDUCTOR

Hiroshi Itahana, and Yoshinori Usui, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 9, 1986, Ser. No. 849,834
Claims priority, application Japan, Apr. 10, 1985, 60-74283
Int. Cl.[4] H01L *25/04*
U.S. Cl. 357—82 **9 Claims**



1. An apparatus for vapor-cooling a semiconductor, comprising a semiconductor stack including an approximately flat board-like semiconductor element, a cooling member and a wiring conductor, a cooling vessel for containing said stack together within a liquid refrigerant to define upper and lower refrigerant regions above and below, respectively, the semiconductor stack to permit cooling of said semiconductor element resulting from the boiling of said liquid refrigerant, wherein said cooling member has a surface facing said wiring conductor and is provided with small apertures opened on the surface thereof facing the wiring conductor, and said conductor is provided with passages for the liquid refrigerant between the upper and the lower refrigerant regions, said passages having a greater width than said small apertures and being vertically disposed in relation to a horizontal defined by an axial disposition of the semiconductor element, the cooling member and the wiring conductor.

4,694,324

MEASUREMENT OF SC/H PHASE USING A POLAR DISPLAY

Earl G. Matney, Newberg, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 23, 1984, Ser. No. 602,859
Int. Cl.[4] H04N *17/02*
U.S. Cl. 358—10 **3 Claims**

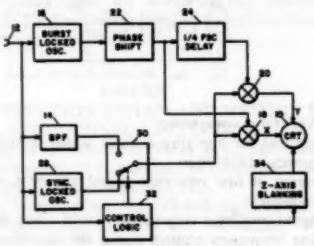
1. A circuit for use with a vectorscope to indicate SC/H phase of a composite video signal, comprising oscillator means for generating a continuous wave signal at subcarrier frequency and having its phase locked to the horizontal sync point of the video signal, and switch means for connection between the output terminal of the filter of the vectorscope and the second inputs of the demodulators of the vectorscope and for connection also to the oscillator means, for alternately connecting the subcarrier burst from the filter of the vectorscope and the sync locked continuous wave from the oscillator means to the demodulators, so that when the subcarrier burst is connected to the demodulators the vectorscope provides an indication at a predetermined angle of the polar display of the vectorscope, whereas when the sync locked continuous wave signal is connected to the demodulators the vectorscope provides an indication at a position of the polar display that is angularly spaced from a predetermined axis of the polar dis-

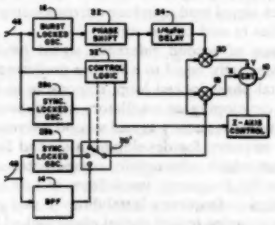
play by an angle that depends on the difference in phase, within the subcarrier sycle, between the sync locked continuous wave signal and the subcarrier burst.

3. An instrument for use in indicating SC/H phase of first and second video signals, comprising

first and second input terminals for receiving the first and second video signals respectively;

a display device for providing a polar display, said display device having a display surface, means for generating a visible dot on the display surface, X and Y deflection means for deflecting the position of the visible dot in mutually perpendicular rectilinear directions, a subcarrier regenerator connected to the first input terminal for generating a continuous wave signal at subcarrier frequency from, and phase-locked to, the subcarrier burst of the first video signal, first and second demodulators having their outputs connected to the X and Y deflection means respectively and each having first and second inputs, means connecting the output of the subcarrier regenerator to the first inputs of the first and second demodulators with a quarter-period relative phase difference, and a filter which is connected to the second input terminal for passing the subcarrier burst of the second video signal;





first means connected to the first input terminal for generating a first continuous wave signal at subcarrier frequency and having its phase locked to the sync point of the first video signal;

second means connected to the second input terminal for generating a second continuous wave signal at subcarrier frequency and having its phase locked to the sync point of the second video signal; and

a switch for successively connecting the first and second sync locked continuous waves and the subcarrier burst of the second video signal to said second inputs of the demodulators, so that when the subcarrier burst is connected to the second inputs of the demodulators the display device displays an indication at a predetermined angular position of the polar display, whereas when one of the sync locked continuous waves is connected to the second inputs of the demodulators the display device displays an indication at a position of the angular display that is angularly spaced from a predetermined axis of the polar display by an angle that depends on the phase difference, in the subcarrier cycle, between the reference subcarrier wave and said one sync locked continuous wave.

4,694,325

INTERFACE CIRCUIT CONTAINED IN A COLOR-TELEVISION RECEIVER AND SERVING TO CONNECT A HOME COMPUTER

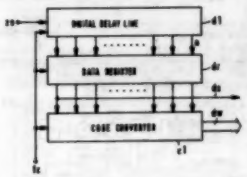
Soenke Mehrgardt, March, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Nov. 6, 1985, Ser. No. 795,660

Claims priority, application European Pat. Off., Nov. 16, 1984, 84113893.6

Int. Cl.[4] H04N *11/22*

U.S. Cl. 358—11 **4 Claims**



1. An interface circuit in a color television receiver which reproduces a video signal containing interlaced fields after analog-to-digital conversion by means of a sampling signal, after digital signal processing in a digital circuit system controlled by said sampling signal which is used as a clock signal, and after digital-to-analog conversion at twice the horizontal frequency, said interface circuit providing the coupling between said receiver and a home computer which provides at least onebit digital color character signals each having a minimum pulse duration approximately equal to but different than the period of said clock signal, said interface circuit comprising:

a first input circuit, a first line memory and a first output circuit for character signals of a first color;

a second input circuit, a second line memory and a second output circuit for character signals of a second color;

a third input circuit, a third line memory and a third output circuit for character signals of a third color;

each of said first, second and third input circuits comprising:

a first digital delay line including a plurality of cascaded delay stages each having a delay equal to the period of said clock signal, said delay line receiving the character signals of the respective color at its input;

a data register having a plurality of cells, each cell having a data input coupled to the output of a corresponding one of said delay stages, said data register having a dynamic write-enable input to which said clock signal is applied, the output of a first one of said plurality of cells providing a data signal output; and

a code converter having a plurality of inputs connected to the outputs of said data register, said code converter being clocked by said clock signal and providing a nonredundantly coded output data word;

said first, second and third line memories each receiving and storing at the frequency of said clock signal the data signal output and the output data word of the respective one of said first, second and third inputs circuits, the data signal outputs and the output data words stored in said first, second and third line memories being read at twice the frequency of said clock signal;

each of said first, second and third output circuits comprising:

a second digital delay line comprising a plurality of like cascaded second delay stages each having a delay equal to one half the period of said clock signal, said second digital delay line receiving at its input the data signal output read from the respective line memory; and

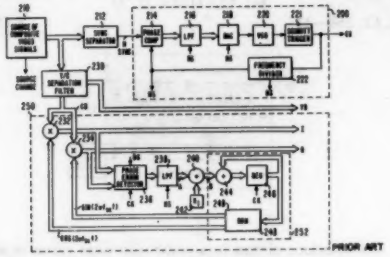
selection means responsive to the output data word read from the respective line memory for electively coupling the output of one of said plurality of second delay stages to an output terminal.

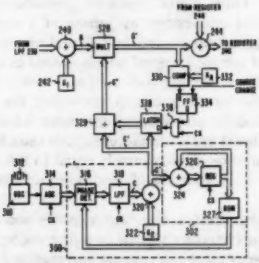
4,694,326

DIGITAL PHASE LOCKED LOOP STABILIZATION CIRCUITRY INCLUDING A SECONDARY DIGITAL PHASE LOCKED LOOP WHICH MAY BE LOCKED AT AN INDETERMINATE FREQUENCY

Walter H. Demmer, Plainsboro Township, Middlesex County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 28, 1986, Ser. No. 845,698
Int. Cl.[4] H04N 9/45
U.S. Cl. 358—19 **13 Claims**





1. In circuitry including a source of clock signal, the instantaneous frequency of which varies about a nominal clock frequency, and a first digital oscillator responsive to said clock signal and to a first frequency control signal for developing an output signal having a predetermined frequency wherein the variations in the frequency of said clock signal tend to cause corresponding variations in the frequency of said output signal, circuitry for substantially removing the variations in the frequency of said output signal comprising:

means for developing a further reference signal having a substantially invariant frequency;

a phase locked loop including:

a second digital oscillator responsive to said clock signal and to a second frequency control signal for providing an oscillatory signal having substantially the same frequency as said reference signal wherein the variations in the frequency of said clock signal tend to cause corresponding variations in the frequency of said oscillatory signal; and

means coupled to said source of reference signal for developing said second frequency control signal being proportional to the difference in phase between said reference signal and said oscillatory signal and tending to compensate said phase locked loop for the variations in the frequency of said oscillatory signal that are related to said clock signal;

means responsive to said second frequency control signal for developing a standard frequency control value representing the value of said second frequency control signal when the frequency of said clock signal is substantially equal to said nominal clock frequency;

means for combining said standard frequency control value and said second frequency control signal to generate a correction signal representing the variations in the frequency of said clock signal with respect to said nominal clock frequency and being substantially independent of said further reference signal; and

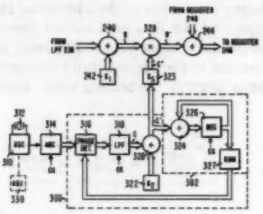
means coupled to said correction signal developing means for modifying said first frequency control signal by said correction signal to substantially remove frequency instabilites in said output signal corresponding to frequency instabilites in said clock signal.

4,694,327

DIGITAL PHASE LOCKED LOOP STABILIZATION CIRCUITRY USING A SECONDARY DIGITAL PHASE LOCKED LOOP

Walter H. Demmer, Plainsboro Township, Middlesex County; Leopold A. Harwood, Bridgewater; Chandrakant B. Patel, Hopewell, and Alvin R. Balaban, Lebanon, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 28, 1986, Ser. No. 845,850
Int. Cl.[4] H04N 9/45
U.S. Cl. 358—19 **9 Claims**



1. Apparatus comprising:

a terminal for applying a clock signal which exhibits frequency instabilities;

a source of first reference signal having a predetermined frequency;

a digital oscillator responsive to said clock signal and to a first frequency control signal for developing an output signal having substantially the same frequency as said first reference signal, wherein the frequency instabilities in said clock signal tend to induce corresponding frequency instabilities in said output signal;

a source of second reference signal having a frequency substantially equal to a further predetermined frequency;

a digital phase locked loop, responsive to said clock signal for developing an oscillatory signal having substantially the same frequency as said second reference signal, including circuitry for developing a second frequency control signal which substantially compensates said phase locked loop for frequency instabilities in said oscillatory signal related to frequency instabilities in said clock signal; and

means, coupled to said digital phase locked loop for generating a stabilizing control signal proportional to said second frequency control signal;

means coupled to said digital oscillator for multiplying the first frequency control signal by the stabilizing control signal to develop a modified first frequency control signal for application to said digital oscillator to substantially stabilize the frequency of said output signal.

4,694,328

RECOMBINATION OF LOW- AND HIGH-RESOLUTION SEGMENTS OF AN EXTENDED ASPECT RATIO PICTURE

Joseph L. LoCicero, Riverside; Melih Pazarci, Chicago, and Theodore S. Rzeszewski, Lombard, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

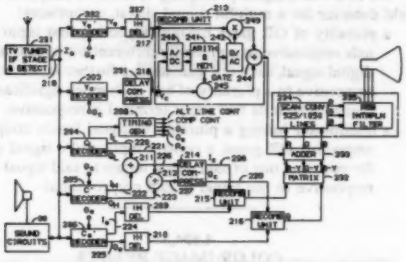
Filed Dec. 21, 1984, Ser. No. 684,488
Int. Cl.[4] H04N 9/64, 7/08, 11/20, 5/208
U.S. Cl. 358—21 V **14 Claims**

4. A system for compensating a received video signal having edge and center portions and a vertical retrace interval and a received test pattern signal transmitted during said vertical

retrace interval of the received video signal, said system comprises:

means responsive to the reception of said test pattern signal for calculating compensation parameters;

means responsive to the calculated compensation parameters for storing said compensation parameters; and



means responsive to said edge and center portions of said received video signal for correcting the transition between said edge and center portions by utilizing the stored compensation parameters.

4,694,329

COLOR CORRECTION SYSTEM AND METHOD WITH SCENE-CHANGE DETECTION

Armand Belmares-Sarabia, Deer Park, N.Y., and Stanley J. Chayka, Parsippany, N.J., assignors to Corporate Communications Consultants, Inc., Fairfield, N.J.

Continuation-in-part of Ser. No. 598,468, Apr. 9, 1984. This application Apr. 12, 1985, Ser. No. 722,801

Int. Cl.[4] H04N *9/64, 9/11*

U.S. Cl. 358—22 **8 Claims**

1. A color correction system for color correcting video picture signals representative of images stored by an image recording medium, comprising:

means for moving the image recording medium and producing video picture signals representative of each of the images stored by the image recording medium;

display means responsive to said video picture signals for displaying pictures corresponding to each of the images stored by the image recording medium;

scene analysis means for analyzing at least one of the video picture signals in each of a plurality of pictures to detect a scene change, said scene analysis means automatically producing a scene-change signal in response to a scene change, said scene analysis means including means for determining a first average level of a video signal corresponding to a color component of the video picture signals in a portion of a first field, means for determining a second average level of said video signal in said portion of a second field, means for evaluating the difference between the first and second average levels based upon a predetermined standard, and means for automatically producing said scene-change signal if the predetermined standard is satisfied, said scene analysis means further including means for selectively changing the size and position of said portion of the first and second fields;

color correction means for selectively producing color correction signals for said video picture signals;

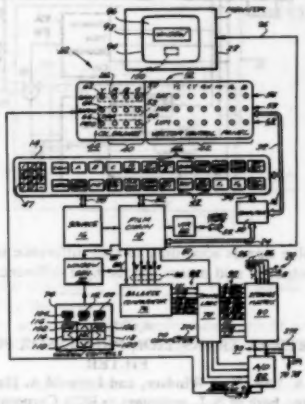
first storage means for selectively storing said color correction signals in response to a first manual command;

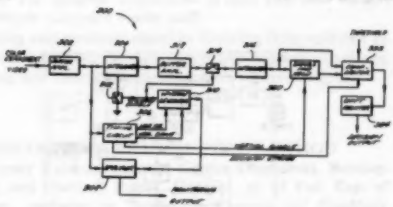
position signal means for producing position signals indicative of the position of each of the images stored by the image recording medium;

means for determining the location of an initial image of a new scene from the scene-change signal and from the position signals, said location determining means producing a location signal representative of the location of the initial image of the new scene;

second storage means for selectively storing said signal representative of the location of the initial image of the new scene in response to a second manual command;

readout means for reading from said first and second storage





means said color correction signals and said location signals, respectively; and

combining means for selectively combining color correction signals read from said first storage means with said video picture signals, said combining means being responsive to the location signals read from said second storage means and to the position signals from said position signal means.

4,694,330

COLOR CORRECTION CIRCUIT

Yutaka Tanaka, Kanagawa, and Shunji Umemura, Chiba, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 19, 1985, Ser. No. 766,802

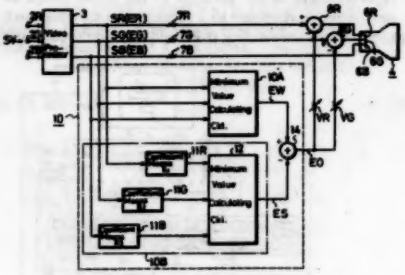
Claims priority, application Japan, Aug. 21, 1984, 59-173599; Aug. 28, 1984, 59-178835

Int. Cl.[4] H04N *9/68*

U.S. Cl. 358—27 **8 Claims**

1. A color correction circuit comprising: three video signal lines for supplying red, green and blue signals, respectively; first means for generating a white color component from means for said red, green and blue signals which are supplied thereto by said three video signal lines; second means for generating a predetermined color component from at least two signals of said red, green and blue signals which are supplied thereto by at least two of said three video signal lines; means for producing a difference signal which is the difference be-

tween the output signals of said first and second detecting means; and means for controlling at least one of said red, green



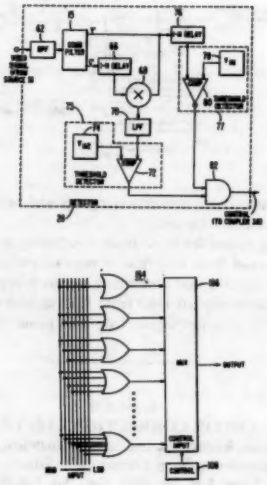
and blue signals according to said difference signal receiving the output of said means producing a difference signal.

4,694,331

VERTICAL TRANSITION PROCESSOR FOR A COMB FILTER

Kirk A. Law, East Windsor, and Leopold A. Harwood, Bridgewater, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 1, 1985, Ser. No. 782,576
Int. Cl.[4] H04N *9/64*
U.S. Cl. 358—31 **17 Claims**



1. In a video signal processing system, including a source of composite video signals including a subcarrier on which color-representative information is modulated in such a manner that the phase of the subcarrier represents the hue and the amplitude of the subcarrier represents the saturation, a comb filter responsive to said source for producing comb filtered luminance and chrominance signals, a luminance processing channel, and a chrominance processing channel; a vertical transition processor, comprising:

means, coupled to said source, for detecting when the subcarrier on adjacent lines has the same phase and the same amplitude, indicating a complementary-color vertical transition; and

means, responsive to said detecting means, for coupling said comb filtered luminance signal to said luminance processing channel including means for altering the frequency content of said comb filtered luminance signal in the presence of a complementary-color vertical transition.

17. In a video signal processing system, an adaptive threshold detector for a multibit digital signal, comprising:

a plurality of OR gates having respective first input terminals responsive to a mutually different bit of said multibit digital signal, each OR gate having further input terminals responsive to a plurality of bits each more significant than that to which its first input terminal is responsive; and

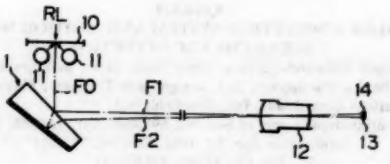
a multiplexer having a plurality of signal inputs coupled to respective OR gates, a control input and a signal output, for coupling one of said signal inputs to said signal output responsive to the signal at said control input.

4,694,332

COLOR IMAGE READER

Satoru Uchida, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 7, 1986, Ser. No. 827,267
Claims priority, application Japan, Feb. 15, 1985, 60-26372
Int. Cl.[4] H04N *1/46*
U.S. Cl. 358—75 **5 Claims**



5. A color-separating mirror having a transparent elongate member which decomposes image light consisting of a plurality of color components, comprising two major surfaces which intersect each other at a predetermined angle, a multi-layer interference filter provided on one of said major surfaces for reflecting a predetermined color component and transmitting the other color components, wherein said filter is produced by alternately depositing by evaporation a non-absorbing material having a high refractive index and a non-absorbing material having a low refractive index, while selecting a predetermined thickness for each of layers and a total number of the layers, and a reflection surface provided on the other major surface for reflecting said other color components, image light representive of color images of a document being incident to said filter at a predetermined angle so that first reflected image light containing only said predetermined color component is reflected by the filter and second reflected image light containing the other color component is reflected by the reflection surface.

4,694,333

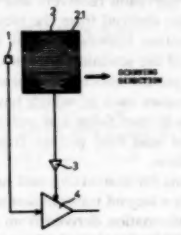
PHOTOELECTRIC RECEIVER WITH LOCAL BRIGHTNESS ADAPTATION

Roderich Rüger, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 19, 1985, Ser. No. 777,840
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1984, 3435064
Int. Cl.[4] H01J *31/49*
U.S. Cl. 358—113 **6 Claims**

1. A photoelectric receiver for camera picture pickup equipment, particularly for thermal-image equipment having local brightness adaptation, comprising at least first detector means

for providing point-by-point scanning of the picture generated by one optical receiving system, and at least one second detector means associated with said first detector means having a larger radiation-sensitive area for picking up at least part of the surroundings of a picture point picked up by the first detector



means, said second detector means being arranged adjacent said first detector means, and further comprising amplifier means coupled to an output of said first detector means for providing gain to an output signal from the first detector means, an output signal of said second detector means controlling the gain of said amplifier means.

4,694,334

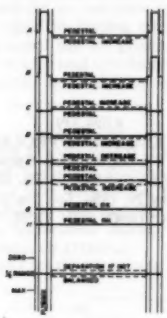
PYROELECTRIC CAMERA SIGNAL PROCESSING HAVING PEDESTAL SIGNAL LEVEL COMPENSATION

Hans R. Bucher, Boulder, and Donald E. Hodd, Niwot, both of Colo., assignors to Xedar Corporation, Boulder, Colo.

Filed Dec. 24, 1985, Ser. No. 813,011

Int. Cl.[4] H04N *5/33*

U.S. Cl. 358—113 **18 Claims**



1. A signal processing system for a pyroelectric camera having a pyroelectric videcon tube, said system comprising:

input means for receiving the output signal from said pyroelectric videcon tube, which output signal includes a pedestal component; and

processing means including signal path establishing means having amplifying means connected with said input means to receive said output signal therefrom and analog-to-digital converter means connected with said amplifying means, said signal processing means also including DC restorer means connected with said amplifying means and feedback means the input of which is connected with said analog-to-digital converter means to receive digital outputs therefrom and the output of which is connected with said DC restorer means to thereby automatically compensate for variations in the level of said pedestal components.

4,694,335

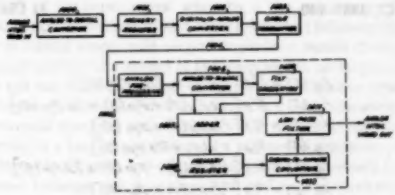
VIDEO SCRAMBLING SYSTEM WITH LINE TILT CORRECTION

Gregory A. Baxes, Denver, Colo., assignor to American Television & Communications Corporation, Englewood, Colo.

Filed Apr. 10, 1985, Ser. No. 721,585

Int. Cl.[4] H04N *7/167, 7/16*; H04K *1/00*

U.S. Cl. 380—14 **34 Claims**



1. A method for correcting line tilt in a video signal, said method comprising the steps of:

adding first and second amplitude reference levels of predetermined amplitudes to time-spaced portions of said video signal;

transmitting said video signal;

receiving said video signal;

sampling said first and second amplitude reference levels in said received signal;

calculating the rate of line tilt based on the difference between the sampled amplitudes of said first and second amplitude reference levels; and

correcting said received signal by deriving from said rate of line tilt a continuous time-varying correction signal and adding said correction signal to said received signal.

4,694,336

DIGITAL DATA TRANSMISSION METHOD

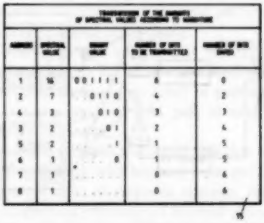
Heinz-Werner Keesen, Hanover; Günter Oberjatzas, Barsinghausen, and Hartmut Peters, Hanover, all of Fed. Rep. of Germany, assignors to Telefunken Fernseh und Rundfunk GmbH, Hanover, Fed. Rep. of Germany

Filed Apr. 14, 1986, Ser. No. 851,531

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1985, 3513074

Int. Cl.[4] H04N *7/133*

U.S. Cl. 358—133 **20 Claims**



1. In a method of transmitting digital data, particularly for digital video signals, including converting an analog signal to a digital signal, processing the digital signal as groups of values in a source coder, feeding the encoded groups of values to a channel coder and then to a transmission channel, and finally feeding the groups of values from the transmission channel through a channel decoder to a source decoder, the improvement comprising: in the source coder, assigning an address to each value of a group, sorting the values of a group according to magnitude, and transmitting said addresses and said values

sorted according to magnitude, with the word length of said sorted spectral values decreasing with decreasing magnitude.

4,694,337

VIDEO LINE RATE CONVERTER

David J. Lyons, Trenton, N.J., assignor to Princeton Electronics Products, Inc., North Brunswick, N.J.

Filed Jan. 23, 1986, Ser. No. 821,850
Int. Cl.[4] H04N 7/01
U.S. Cl. 358—140 **31 Claims**

$$Fq(1) = 3/5\left[Fp(1) + 2/3\ Fp(2)\right]$$
$$Fq(2) = 3/5\left[1/3\ Fp(2) + Fp(3) + 1/3\ Fp(4)\right]$$
$$Fq(3) = 3/5\left[2/3\ Fp(4) + Fp(5)\right]$$
$$Fq(4) = 3/5\left[Fp(6) + 2/3\ Fp(7)\right]$$
$$Fq(5) = 3/5\left[1/3\ Fp(7) + Fp(8) + 1/3\ Fp(9)\right]$$
$$Fq(6) = 3/5\left[2/3\ Fp(9) + Fp(10)\right]$$

1. A method for converting an input video signal comprising a plurality of input frames, each said input frame including an odd field and an even field, each input frame having P input lines, P being an integer much greater than one, into an input video signal comprising a plurality of output frames, each said output frame including an odd field and an even field, each output frame having Q output lines, Q being an integer much greater than one but different than P, said method comprising the steps of:

receiving said input video signal; and

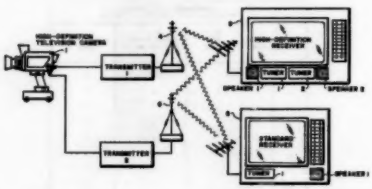
generating said output video signal utilizing substantially all of the video information contained in said video input signal, said generating step generating each said output field as a function of an associated set of first and second input fields, and initiating the generation of each said output field after all of said first, but before all of said second, input field of said associated set of input fields has been received.

4,694,338

HIGH-DEFINITION TELEVISION TRANSMISSION SYSTEM

Mikhail Tsinberg, Riverdale, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Apr. 25, 1986, Ser. No. 856,622
Int. Cl.[4] H04N 7/01, 7/04
U.S. Cl. 358—141 **14 Claims**



4. A television transmission and reception system comprising a television transmitter and receiver, said transmitter transmitting a high-definition television signal containing picture information which, on display, forms first picture frames at a rate of 2n frames per second, where n is a standard number of picture frames per second formed by the picture information in a standard television signal, and having a width which is wider than that of a standard aspect ratio picture frame, said high-definition television signal having a bandwidth greater than that of a standard television signal, each of said first picture frames including a single field having m sequentially scanned scanning lines, where m is a standard number of scanning lines in each picture frame formed by the picture information in said standard television signal in which said scanning lines of said standard television signal are arranged in two interlaced fields; characterized in that said television transmitter comprises:

first means for converting said high-definition television signal into a first transmission signal compatible with standard television receivers and containing first picture information derived from the picture information in said high-definition television signal forming substantially a first half of the scanning lines in said first picture frames, said first picture information forming, on display, second picture frames each of which having m interlaced scanning lines in two fields and corresponding to a selected portion of said first picture frames having a standard aspect ration;

second means for converting said high-definition television signal into a second transmission signal containing second picture information derived from the picture information in said high-definition television signal forming substantially a second half of the scanning lines in said first picture frames and forming a portion of said first picture frames not included in said selected portion in said second picture frames, said second picture information forming, on display, third picture frames each of which having m scanning lines in two fields, whereby said first and second picture information collectively include substantially all of the picture information in said high-definition television signal;

means for modulating said first and said second transmission signals onto a first and second carrier, respectively; and

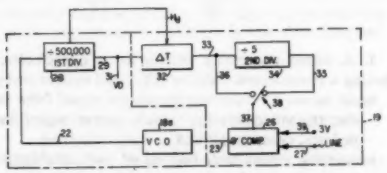
means for simultaneously transmitting said first and said second modulated carriers.

4,694,339

POWER LINE LOCKED IMAGE PROCESSING SYSTEMS

Paul Fenster, Petach Tikvah, and Zeev Ganor, Herzelia, both of Israel, assignors to Elscint Ltd., Haifa, Israel

Filed May 29, 1984, Ser. No. 614,805
Int. Cl.[4] H04N 5/04; H03L 7/00
U.S. Cl. 358—148 **14 Claims**



1. An imaging system for processing acquired data to convert said acquired data to images on video display devices, said system obtaining power from a power line, said system comprising: system oscillator means for providing frequency signals, locking means for locking the frequency of the system oscillator means to the frequency of the power line, and said locking means including means for enabling said locking even when the system oscillator means frequency is other than an integer multiple of the power line frequency.

4,694,340
VERTICAL SYNCHRONIZING SIGNAL SEPARATING CIRCUIT

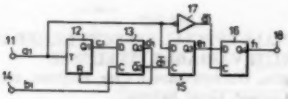
Hidenori Tanaka, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed May 19, 1986, Ser. No. 864,783

Claims priority, application Japan, May 20, 1985, 60-74494[U]

Int. Cl.⁴ H04N *5/10*

U.S. Cl. 358—154 **12 Claims**



1. A vertical synchronizing signal separating circuit comprising:

a first input terminal supplied with a composite synchronizing signal;

a second input terminal supplied with clock pulses having a predetermined repetition frequency;

a series circuit comprising a pair of flip-flops coupled in series and supplied with the composite synchronizing signal and the clock pulses for generating a first pulse signal in phase synchronism with leading edges of the composite synchronizing signal, said first pulse signal having a pulse width corresponding to one period of the clock pulses;

a first latch circuit supplied with the composite synchronizing signal and the first pulse signal for latching the composite synchronizing signal by trailing edges of the first pulse signal so as to produce a second pulse signal having a predetermined level when the composite synchronizing signal has a pulse width greater than that of a horizontal synchronizing signal thereof; and

a second latch circuit supplied with the composite synchronizing signal and the second pulse signal for latching the second pulse signal by trailing edges of the composite synchronizing signal and for producing an output pulse signal thereof as a vertical synchronizing signal separated from the composite synchronizing signal.

4,694,341
SAMPLE-AND-HOLD CIRCUIT

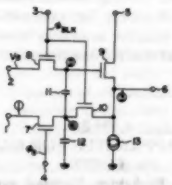
Mitsuo Soneda, and Yoshikazu Hazama, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 4, 1986, Ser. No. 826,019

Claims priority, application Japan, Feb. 4, 1985, 60-14467[U]; Feb. 9, 1985, 60-17310[U]

Int. Cl.⁴ H04N *5/44*; G11C *27/02*

U.S. Cl. 358—160 **4 Claims**



1. A buffer circuit for translating a periodic input signal comprising; an input terminal supplied with the input signal, first gate means connected to said input terminal and being turned on during a first portion of a period of the input signal, first capacitive means connected to said first gate means; second capacitive means connected to the connection point of said first capacitive means and said first gate means, a source (emitter) follower transistor having a gate (base) connected to said second capacitive means, a source (emitter) and a drain (collector), second gate means connected between the source (emitter) of said source (emitter) follower transistor and said connection point of said first gate means and said first capacitive means, said second gate means being turned on during a second portion of a period of the input signal, third gate means connected to the gate (base) of said source (emitter) follower transistor and being turned on during the second portion of a period of the input signal whereby a the gate-source (base-emitter) offset voltage of said source (emitter) follower transistor is stored across said second capacitive means during the second portion of a period of the input signal, an output terminal led out from the source (emitter) of said source (emitter) follower transistor, said first portion is a trace duration of a horizontal scanning period of the video signal and said second portion is a blanking duration of a horizontal scanning period of the video signal, and wherein said third gate means is connected between the gate (base) of said source (emitter) follower transistor and a voltage source with an average voltage level of said video signal.

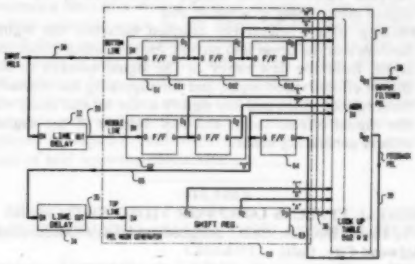
4,694,342
SPATIAL FILTER USEFUL FOR REMOVING NOISE FROM VIDEO IMAGES AND FOR PRESERVING DETAIL THEREIN

Kevin J. Klees, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 1, 1986, Ser. No. 858,337

Int. Cl.⁴ H04N *5/21, 1/40*

U.S. Cl. 358—167 **14 Claims**



1. Apparatus for a spatial filter which provides an output filtered pel value for a corresponding input pel in an incoming video image, said apparatus comprising:

means, responsive to pel values that form the incoming image, for producing a pel mask associated with said input pel, said pel mask defining an array of pels including said input pel wherein each of said pels in said mask has a corresponding pel value;

means, responsive to the values of said pels that form said pel mask, for determining whether said input pel is a noise pel or an image pel and, in response thereto, for producing one of a pre-defined plurality of filtered pel values and a corresponding one of a pre-defined plurality of feedback pel values;

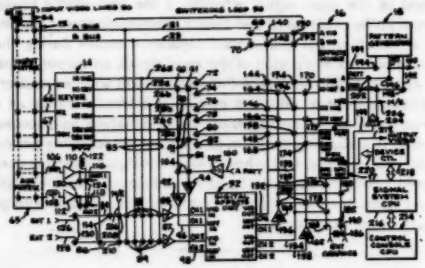
means for applying said produced filtered pel value as said output filtered pel value;

means for applying said produced feedback pel value from said determining means to said pel mask producing means such that said produced feedback pel value becomes one of the pel values for the pels that form the pel mask for a subsequently occurring input pel and wherein the value of said produced feedback pel determines whether said filter operates recursively or non-recursively.

4,694,343
DIGITAL EFFECTS DEVICE INTEGRALLY COMBINED WITHIN A VIDEO SWITCHER

Jay L. Flora, Boulder, Colo., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 28, 1986, Ser. No. 845,901
Int. Cl.[4] H04N 5/265
U.S. Cl. 358—183 **12 Claims**



1. A system for generating digital effects via a video switcher having selectable signal sources, a keyer, a first mixer for supplying a mix effects signal, and a pattern generator for supplying a pattern signal to the first mixer, comprising:

a second mixer coupled electrically downstream of the first mixer;

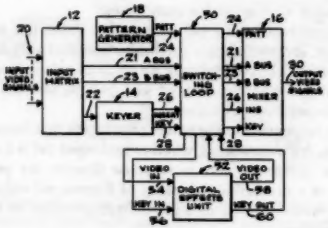
digital effects generating means having digital effects video and key inputs and outputs and disposed to digitally manipulate video and key signals in accordance with the digital effect being generated; and

switching means selectively coupled between the signal sources and the keyer and mixers, for re-routing a selected signal from the first mixer or the signal sources to the digital effects video input, and for supplying the digitally manipulated video and key signals to the second mixer via the digital effects video and key outputs of the digital effects generating means.

4,694,344
DIGITAL EFFECTS LOOP FOR VIDEO SWITCHERS

Jay L. Flora, Boulder, Colo., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 28, 1986, Ser. No. 845,902
Int. Cl.[4] H04N 5/265
U.S. Cl. 358—183 **27 Claims**



1. A system for generating digital effects via a video switcher having a video source for supplying video source signals, a keyer coupled to the video source for supplying insert video and key signals, a pattern generator for supplying a pattern signal, and a mixer for providing an output video signal and having inputs coupled to the video source, the keyer and the pattern generator, comprising:

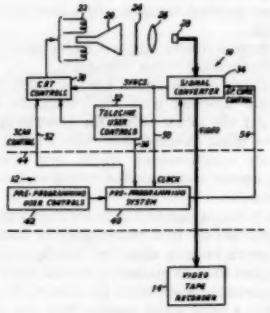
digital effects generating means operatively inserted between the video source and said mixer, and between the keyer and the mixer, for receiving a selected signal of the signals supplied within the switcher by the video source and the keyer and for supplying a selected manipulated digital effects output output signal; and

control means integral with the switcher and coupled to the digital effects generating means for selectively re-routing the selected signal to the digital effects generating means and then re-routing the selected manipulated digital effects output signal back to the inputs of the mixer.

4,694,345
VIDEO SIGNALS SPECIAL EFFECTS GENERATOR WITH VARIABLE PIXEL SIZE

Jeremy A. Rodgers, Welwyn Garden City, England, assignor to Rank Cintel Limited, Great Britain

Filed Apr. 11, 1985, Ser. No. 722,153
Int. Cl.[4] H04N 3/36
U.S. Cl. 358—216 **24 Claims**



1. Apparatus for producing special effects in video signals comprising a telecine and telecine programming means, wherein:

(1) said telecine comprises:

(a) a light source;

(b) a light-sensitive detector;

(c) scanning means for scanning said source of said detector with a scanning raster to provide a raw video signal;

(d) means for locating a stationary transparent film portion containing a stationary image between said source and said detector; and

(e) signal conversion means for receiving said raw video signal and providing an output video signal in standard format as a function of said stationary image, said output video signal including video timing signals; and

(2) said telecine programming means comprises:

(a) store means for storing control functions; and

(b) raster control means for controlling said scanning raster of said telecine scanning means in response to both said stored control functions and said video timing signals.

4,694,346
METHOD AND APPARATUS FOR GATING IMAGE TUBES

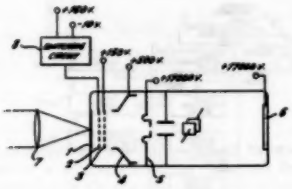
Alexander E Huston, Berkshire, England, assignor to Hadland Photonics Limited, Hertfordshire, England

Filed Jul. 29, 1985, Ser. No. 759,700
Claims priority, application United Kingdom, Feb. 27, 1985, 8505012
Int. Cl.[4] H04N 5/228; H01J 31/02
U.S. Cl. 358—218 **2 Claims**

1. A method of gating an image tube including a cathode, screen, an electrode assembly for forming a focussed image on

said screen and first and second electrodes disposed successively along said image tube between said photo cathode and said electrode assembly, said first electrode being disposed nearer to said cathode than is said second electrode, said method comprising:

gating said first electrode by raising for a short interval of time the potential of said first electrode relative to said cathode, said raised potential allowing passage of electrons beyond said first electrode for said short interval of time; and



maintaining a constant level of potential on said second electrode at least during said time interval, said constant level being less than said raised potential applied to said first electrode,

irregularity or variation in said potential of said first electrode during said interval not disturbing electric field conditions produced by said electrode assembly in said image tube.

4,694,347

TELEVISION RECEIVER HAVING A LIQUID CRYSTAL DISPLAY DEVICE

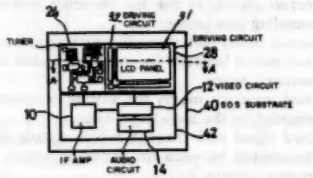
Katsu Ito, Tokorozawa, Japan, assignor to Citizen Watch Co. Ltd., Tokyo, Japan

Filed May 30, 1986, Ser. No. 868,715

Claims priority, application Japan, May 31, 1985, 60-118064

Int. Cl.[4] H04N *7/00*

U.S. Cl. 358—236 **2 Claims**



1. A television receiver comprising:

a transparent SOS substrate;

a liquid crystal display panel provided on a sapphire portion of the SOS substrate;

receiving means, including an intermediate-frequency amplifier, video signal circuit and audio signal circuit, for producing audio signals and video signals;

driving means responsive to the video signals for driving the liquid crystal display panel to display images represented by said video signals;

said intermediate-frequency amplifier, video signal circuit and audio signal circuit of the receiving means and active elements of the driving means being monolithically mounted on the SOS substrate at a portion lateral of the liquid crystal display panel;

said receiving means including a gallium arsenide transistor mounted on said SOS substrate as an element of a high frequency amplifier;

said receiving means further including a surface acoustic wave device as an intermediate-frequency filter, the surface acoustic wave device being mounted on said SOS substrate.

4,694,348

METHOD OF DRIVING LIQUID CRYSTAL DISPLAY PANEL OF TV RECEIVER

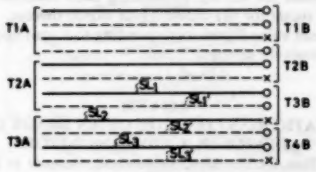
Kiyoshi Kamiya; Atsushi Shiraishi, both of Tokorozawa, and Fuminori Suzuki, Tanashi, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1986, Ser. No. 872,333

Claims priority, application Japan, Jun. 14, 1985, 60-129689; Aug. 30, 1985, 60-191755

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—236 **4 Claims**



1. A method of driving a liquid crystal display panel of a television receiver having a plurality of scanning electrodes, for displaying data of a composite video signal with increased resolution by displaying six scanning lines of the video signal by two rows of liquid crystal display elements, whereby of a set of six scanning lines comprising 3 successive scanning lines of a first field of said composite video signal and 3 successive scanning lines of a second field of said composite video signal which coincide with or are displaced by one scanning line pitch from said 3 successive scanning lines of the first field in one frame of said composite video signal, 3 lines of said six set of scanning lines are displayed by liquid crystal display elements driven by a first one of said scanning electrodes and the remaining three lines of said set of six scanning lines are displayed by liquid crystal display elements driven by a second one of said scanning electrodes.

4,694,349

LIQUID CRYSTAL MATRIX DISPLAY PANEL DRIVER CIRCUIT

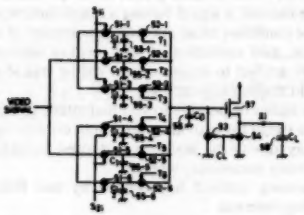
Makoto Takeda, Tenri; Kunihiko Yamamoto, Nara; Nobuaki Matsubayashi, Tenri, and Hiroshi Take, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 31, 1985, Ser. No. 739,849

Claims priority, application Japan, Jun. 1, 1984, 59-113744

Int. Cl.[4] H04N *3/14, 5/66*

U.S. Cl. 358—241 **3 Claims**



1. A TV picture display unit comprising:

a liquid crystal matrix display panel for displaying a picture from a plurality of television video signals corresponding to successive scan lines of a television picture frame; and

driver circuit means for driving said matrix display panel

with signals corresponding to said video signals, including,

means for sampling video signals corresponding to alternate scan lines of said frame to provide successfully sampled signals,

means for storing at least first and second successively sampled signals,

means for forming a signal defining the mean value of said stored first and second successively sampled signals, and

means for sequentially applying said stored first sampled signal, said mean value signal, and said stored second sampled signal to said matrix display panel corresponding to said successive scan lines of said television picture frame,

said means for storing substituting each successively sampled signal for the oldest signal stored therein,

said mean value signal corresponding to a scan line between successively sampled signals.

4,694,350

AUTOMATIC BIAS CONTROL OF AN IMAGE DISPLAY DEVICE IN A VIDEO MONITOR

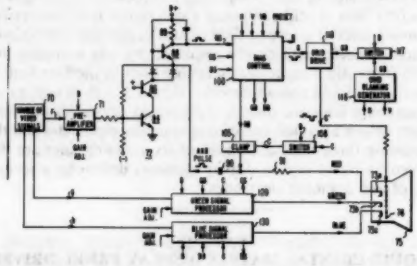
Werner Hinn, Zollikerberg, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 15, 1986, Ser. No. 896,503

Claims priority, application United Kingdom, Oct. 1, 1985, 8524197

Int. Cl.[4] H04N *5/68, 9/20*

U.S. Cl. 358—242 **5 Claims**



1. A data display video monitor system comprising:

an image display device for displaying data on a display screen thereof in response to a video data signal, said display screen including a visible area along an edge of said display screen which is normally devoid of displayed data;

means for exciting said display device during an excitation interval within a sensing interval to produce, at an electrode thereof, a signal having a magnitude representative of the condition of an operating parameter of said display device, said excitation of said display device causing a visible artifact to appear in said visible area along an edge of said display screen; and

control means responsive to said magnitude of said representative signal for providing an output control signal to said display device to maintain a desired condition of said operating parameter; wherein

each sensing interval is preceded by and followed by a holding interval;

each sensing interval encompasses a first plurality of vertical field intervals during which said visible artifacts appear; and

each holding interval encompasses a second plurality of vertical field intervals substantially greater than said first plurality of vertical field intervals, said visible artifacts being absent during said holding interval.

4,694,351

PICTURE SIGNAL PROCESSING APPARATUS

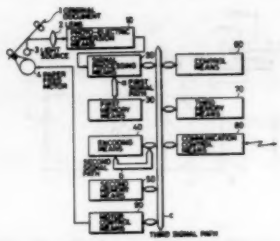
Koozoo Nakamura, Hitachiohta; Nagaharu Hamada; Masaharu Tadauchi; Yasuyuki Kozima, all of Hitachi; Noboru Suemori, and Takamitu Kouno, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 14, 1986, Ser. No. 863,243

Claims priority, application Japan, May 15, 1985, 60-101301

Int. Cl.[4] H04M *1/00*

U.S. Cl. 358—256 **6 Claims**



1. A picture signal processing apparatus wherein digital picture signals are encoded in redundancy reduction encoding system, said apparatus comprising:

a signal processing means for performing signal processing at least picture element density conversion of picture signals;

an encoding means for inputting the digital picture signals processed by the signal processing means and performing encoding processing at least conversion of the signals into redundancy reduction code;

a first memory means for storing temporarily the digital picture signals so that the signal processing means performs the picture element density conversion;

a first signal path through which signals are received or transmitted between the signal processing means and the first memory means;

a second memory means for storing temporarily the digital picture signals so that the encoding means performs the encoding processing;

a second signal path through which signals are received or transmitted between the encoding means and the second memory means;

a third memory means for storing temporarily the code encoded by the encoding means;

a third signal path through which signals are received or transmitted between the encoding means and the third memory means; and

a control means connected to the third signal path for controlling processing of at least the signal processing means and the encoding means through at least the third signal path.

4,694,352

IMAGE INFORMATION PROCESSING SYSTEM

Kenzoh Ina; Masatoshi Otani, and Kenichi Mishima, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1985, Ser. No. 776,007

Claims priority, application Japan, Sep. 21, 1984, 59-196576; Sep. 28, 1984, 59-202013; Sep. 28, 1984, 59-203149

Int. Cl.[4] H04N *1/32, 1/41*

U.S. Cl. 358—257 **16 Claims**

1. An image information system comprising:

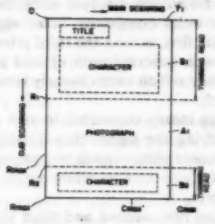
reading means for photoelectrically reading an image of an original and producing image data;

means for designating arbitrary area of the image of the original; and

means for transmitting the image data produced by said

reading means, said transmitting means including means for compressing the image data produced by said reading means,

said transmitting means being operable to transmit image



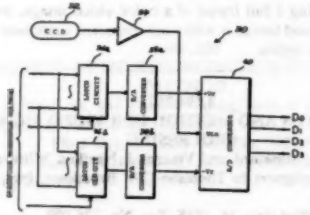
data of either a first area designated by said designating means or a second area other than said first area upon compression of the image data of said either area by said compressing means, and to transmit image data of another area on a non-compression basis.

4,694,353

DIGITAL SCANNER

Tsutomu Sato, Yokohama; Noboru Murayama, Tokyo, and Key Sato, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 4, 1985, Ser. No. 804,541
Claims priority, application Japan, Dec. 6, 1984, 59-258249
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—283 **3 Claims**



1. A scanner for reading and quantizing images on a document in multiple tones, comprising:

a photoelectric transducer for reading the images and photoelectrically converting the images to produce an electrical signal;

means for producing two digital signals for specifying an upper threshold voltage level and a lower threshold voltage level;

a first latch means and a second latch means connected to said means for producing two digital signals for receiving said two digital signals and for storing said signals therein;

two digital-to-analog converters, each connected to a respective latch means for receiving said digital signals and for converting said digital signals to an upper threshold voltage level signal and a lower threshold voltage level signal;

an analog-to-digital converter connected to said digital-to-analog converters and to said photoelectric transducer for receiving said electrical signal at a signal input terminal, said upper threshold voltage level signal at an upper threshold input terminal and said lower threshold voltage level signal at a lower threshold input terminal;

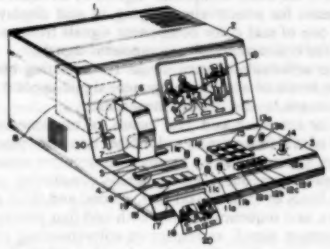
wherein the means for producing two digital signals is constructed to determine a regular upper and a regular lower threshold voltage level for reading the image next time, based on data produced by reading a single line or a plurality of lines of the images with respect to a particular upper and a particular lower threshold voltage level.

4,694,354

METHOD AND APPARATUS FOR PRINTING TRIMMING INSTRUCTIONS FOR DEVELOPER OF PHOTOGRAPHS

Hiroshi Tanaka, Tokyo, and Shinsuke Fukehara, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 20, 1986, Ser. No. 841,610
Claims priority, application Japan, Mar. 29, 1985, 60-65881
Int. Cl.[4] H04N *1/21, 7/18;* **G03F** *3/10;* **G01D** *9/00*
U.S. Cl. 358—296 **14 Claims**



1. An apparatus for printing trimming instructions for use in trimming a photograph, comprising:

first means for picking up images from photofilm and generating a video signal based thereon;

second means for displaying a video image on a display creen, which video image corresponds to the image on said photofilm;

third means for drawing a frame delimiting a section of the image to be trimmed on said display screen; and

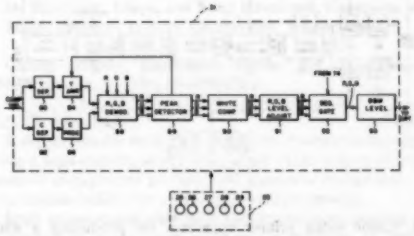
fourth means for printing a copy of the image on said display screen.

4,694,355

BLACK AND WHITE LEVEL ADJUSTMENT AND NORMALIZATION CIRCUIT FOR A COLOR VIDEO PRINTER

Douglas W. Constable, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 16, 1985, Ser. No. 776,231
Int. Cl.[4] H04N *5/84, 9/81*
U.S. Cl. 358—332 **3 Claims**



1. In a color video printer apparatus for producing a color photographic copy from a color video signal, said apparatus including a monochrome electronic display means for displaying an image of a video signal; an exposure station located along an optical path from said display means at which is located a color photographic element; and a continuously

moving color filter having first, second and third primary color filters sequentially movable into said optical path in synchronism with a field frequency of said color video signal; video signal processing apparatus comprising:

means for providing a color video signal having a separated chrominance signal and a luminance only signal;

variable gain amplifying means for amplifying said luminance signal;

demodulating means for demodulating said amplified luminance signal and said chrominance signal into concurrent first, second and third primary color component signals;

means for reducing the gain of said amplifier means in response to detection of a value of any one of said color component signals exceeding a predetermined limit so as to reduce a value of said luminance signal and reduce the value of the color component signals by an equal amount;

gate means for selectively applying to said display means only one of said color component signals from each field of three concurrent color component signals;

operator adjustable control means for adjusting black and white levels of a color component signal applied by said gate means to said display means; and

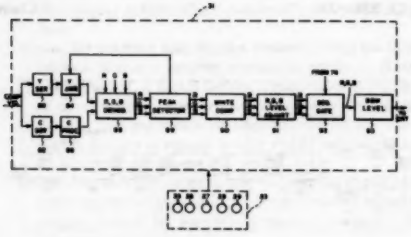
means for actuating said gate means, in response to movement of said first primary color filter into said optical path, to apply to said display means a consecutive sequence of six color component video signals consituting odd and even fields of each of said first, second and third primary colors, said sequence starting with said first primary color component signal, as respective corresponding color filters are moved into said optical path, such that said display means produces a sequence of six monochrome images which are filtered by said respective corresponding color filters to expose a color photographic element at said exposure station to a sequence of six consecutive color field images constituting a full frame of a color video image, wherein each of said sequential fields has been normalized to have similar levels of black and white and wherein the black and white levels in an exposed photographic element may be adjusted to the tastes of a printer operator through adjustment of the black and white levels of said color component signals.

4,694,356

MODIFICATION OF COLOR COMPONENT VIDEO SIGNALS TO COMPENSATE FOR DECREASING WHITE SENSITIVITY OF PHOTOGRAPHIC ELEMENT

Douglas W. Constable, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 16, 1985, Ser. No. 776,236
Int. Cl.[4] H04N *5/84, 9/81*
U.S. Cl. 358—332 **3 Claims**



1. Color video printer apparatus for producing a white compensated color photographic copy from a color video signal comprising:

monochrome electronic display means for displaying a monochrome image of a video signal;

an exposure station which is located along an optical path from said display means, and at which is located a color photographic element having an exposure characteristic which is proportional over a major portion of its exposure range and which has decreasing sensitivity over its near white range;

video signal means for providing a color video signal constituting frames of interlaced odd and even fields repeated at broadcast field frequency wherein each field includes three concurrent color component video signals respectively representing first, second and third primary color of a color field image, wherein each of said signals has a signal characteristic which varies linearly between a black and a white level;

white compensating means connected to said video signal means for modifying the signal chracteristic of each of said color component video signals to compensate for the decreased sensitivity in the near white region of said photographic element;

a color filter having first, second and third primary color filters continuously movable into said optical path in synchronism with said field frequency of said color video signal;

selectively actuatable gate means electrically connected between said white compensating means and said display means for applying to said display means one of the three white compensated color component signals; and

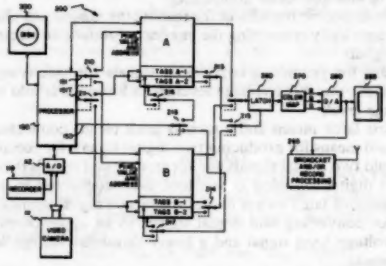
means for actuating said gate means in response to detection of said first primary color filter being moved into said optical path, to apply to said monochrome display means a sequence of six consecutive compensated color component video field signals constituting odd and even fields of each of said primary colors as respective corresponding filters are sequentially moved into said optical path such that said display means produces a sequence of six consecutive monochrome images which are filtered by respective corresponding color filters to exposs said photographic element to a sequence of six color field images constituting a full frame of a color video image, wherein said exposed image is white compensated in its near white exposure region.

4,694,357

APPARATUS AND METHOD FOR VIDEO SIGNAL PROCESSING

Altaf Rahman, Stamford, and Vincent J. Navikas, Milford, both of Conn., assignors to Thomson-CSF Broadcast, Inc., Stamford, Conn.

Filed Apr. 24, 1985, Ser. No. 726,409
Int. Cl.[4] H04N *5/92*
U.S. Cl. 360—9.1 **16 Claims**



1. Apparatus for encoding, storing, reading out, and decoding frames of video signal, comprising:

a memory block, said memory block being capable of storing a frame of video pixel values at respective pixel addresses and a pair of tag bits associated with each pixel address;

a storage medium;

means for encoding a frame of video signal and storing the encoded information in said storage medium, the encoded information including a pixel position indication and an

associated pixel value for positions in a frame where said pixel value changes from the pixel value at the adjacent pixel position;

means for writing an encoded frame from said storage medium into said memory block the pixel values associated with respective pixel positions of the encoded frame being written into corresponding pixel addresses of said memory block;

means for setting one of the tag bits associated with each pixel address at which a pixel value is being stored in said memory block;

means for subsequently reading out sequentially the encoded information in said memory block, and for simultaneously resetting the other of the tag bits associated with each pixel address;

means responsive to said ones of said tag bits for decoding the pixel values read out of said memory to provide a decoded output frame having a decoded pixel value at each pixel position of said decoded output frame; and

means for reversing the roles of said ones of said tag bits and said other tag bits during the writing of the next encoded frame into said memory block, the reading of said next frame out of said memory block and said decoding; whereby said others of said tag bits are used for said writing, reading and decoding, and said ones of said tag bits are reset.

4,694,358

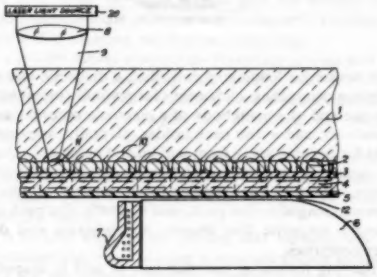
MAGNETO-OPTIC RECORDING STRUCTURE AND METHOD

Boris J. Muchnik, and Fred W. Spong, both of Boulder, Colo., assignors to Kerdix, Inc., Boulder, Colo.

Filed Oct. 28, 1985, Ser. No. 792,148

Int. Cl.[4] G11B *5/02, 5/06, 11/00, 13/00*

U.S. Cl. 360—59 **15 Claims**



1. An integral recording structure comprising a magneto-optic layer and an opposed magnetic recording layer, data when magnetically recorded on said magnetic recording layer produces fringing magnetic fields, the magneto-optic layer being positioned to fall within the fringing magnetic field of data magnetically recorded on said magnetic recording layer, said magneto-optic layer being subject to local magnetization in alignment with said fringing field by reduction of the coercivity of the magneto-optic layer, said reduction being effected by application of a laser beam to said magneto-optic layer.

4,694,359

DIAGNOSTIC DISK FOR CHECKING THE HEAD ALIGNMENT OF MAGNETIC DISK DRIVES

Takeo Oya, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 10, 1986, Ser. No. 827,689

Claims priority, application Japan, Feb. 8, 1985, 60-22889; Feb. 14, 1985, 60-27088

Int. Cl.[4] G11B *5/56*

U.S. Cl. 360—76 **7 Claims**

1. In a diagnostic disk for checking an azimuthal alignment of a magnetic head of magnetic disk drive with respect to the standard head alignment, said diagnostic disk being driven by said magnetic disk drive with a radially central portion of said diagnostic disk as the center of rotation whereby a concentric ideal head read path is provided on a surface of said diagnostic disk by said standard head alignment, said diagnostic disk comprising a concentric checking track provided on said ideal head read path and divided in a plurality of sectors, each of said sectors including:

an identification field for recording a sector number identifying said sector, said identification field having substantially the same width as said ideal head read path in the radial direction of said diagnostic disk and said sector number being recorded at an angle perpendicular to said radial direction;

a data field for recording a predetermined data pattern, said data pattern being recorded at an first azimuthal angle with respect to said radial direction; and

noise areas for recording a predetermined noise pattern different from said data pattern, said noise areas being located at both sides of said data field in said radial direction, said noise pattern of one of said noise area being recorded at a second azimuthal angle inclining in the clockwise direction with respect to the perpendicular line to the recording direction of said data pattern, and said noise pattern of the other of said noise areas being recorded at a third azimuthal angle inclining in the counterclockwise direction with respect to said perpendicular line.

4,694,360

TAPE CASSETTE WITH CONCAVE ENGAGEMENT PORTION AND PLAYER WITH HOOK ENGAGEABLE THEREWITH

Masao Ohyama, Tokyo; Yoshinori Yamamoto, Kanagawa; Kenichi Horikawa, Tokyo, and Kenji Kawakami, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 3, 1985, Ser. No. 719,432

Claims priority, application Japan, Apr. 3, 1984, 59-48693[U]; Jun. 5, 1984, 59-83087[U]

Int. Cl.[4] G11B *15/675, 15/60, 23/087*

U.S. Cl. 360—96.5 **5 Claims**

1. Apparatus for recording signals on or reproducing signals from a tape cassette that has an upper surface formed with a concave engagement portion; said apparatus comprising:

a cassette holder for receiving said tape cassette;

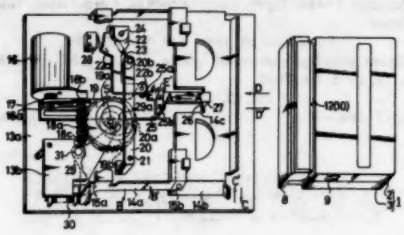
hook means engageable with said engagement portion;

means for moving said hook means between an ejection position wherein said tape cassette can be manually inserted partway into or removed from said holder and a loaded position wherein said cassette is fully drawn into said holder;

tape drive means; and

means for moving said holder between a load/eject position

wherein said cassette can be loaded into or ejected from said holder and a tape drive position wherein said cassette



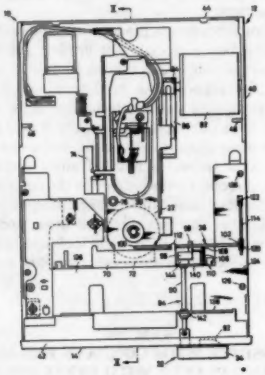
engages said tape drive means, whereby a recording and/or reproducing operation can be performed.

4,694,361

DATA TRANSFER APPARATUS HAVING A SIMPLIFIED CLAMP MECHANISM FOR HOLDING A DISKLIKE RECORD MEDIUM IN PLACE

Isamu Tsuchiya, Oume; Tsutomu Kawasaki, Iruma, and Yoshiaki Sakai, Higashikurume, all of Japan, assignors to Teac Corporation, Tokyo, Japan

Filed Apr. 1, 1986, Ser. No. 846,921
Claims priority, application Japan, Apr. 3, 1985, 60-49763[U]
Int. Cl.[4] G11B *17/022*
U.S. Cl. 360—97 **7 Claims**



1. A data transfer apparatus having at least one transducer head for data transfer with interchangeable disklike record media, comprising:

(a) frame means providing a space for the loading and unloading of a record medium to and from a preassigned data transfer position for data transfer with the transducer head;

(b) a drive assembly disposed on one side of, and in a concentric relation with, the record medium when the latter is in the data transfer position;

(c) a clamp assembly disposed on the other side of the record medium;

(d) a clamp arm having the clamp assembly rotatably mounted thereto and movable with respect to the frame means between an unclamping position, where the clamp assembly is away from the drive assembly to allow the loading and unloading of the record medium to and from the data transfer position, and a clamping position where the clamp assembly engages between itself and the drive assembly the record medium being held in the data transfer position;

(e) resilient means biasing the clamp arm from the clamping toward the unclamping position;

(f) a clamp lever operatively engaged at a first end thereof with the clamp arm for moving the same from the unclamping to the clamping position against the bias of the resilient means, the clamp lever being made of sheet metal and formed to include a support portion bent right angularly from a second end thereof;

(g) a flat lever mount rigidly attached to the frame means and having an aperture defined therein;

(h) the support portion of the clamp lever being adapted to undetachably engage in the aperture in the lever mount so as to allow the pivotal motion of the clamp lever about the second end thereof; and

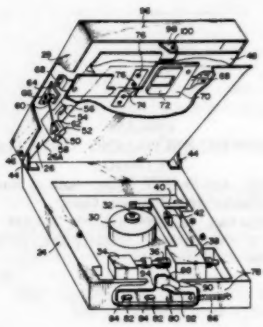
(i) a clamp actuating mechanism for acting on the clamp lever so as to cause the same to move the clamp arm from the unclamping to the clamping position against the bias of the resilient means.

4,694,362

DEVICE FOR LOADING OR UNLOADING MAGNETIC DISC PACK

Shigenori Oosaka, Kanagawa, and Shinichi Matsuda, Oomiya, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 7, 1984, Ser. No. 648,227
Int. Cl.[4] G11B *5/012, 23/03*
U.S. Cl. 360—97 **2 Claims**



1. A device for loading or unloading a magnetic disc pack, said device comprising a lid, means for pivotally mounting said lid on one end of a main body of a magnetic recorder and/or a reproducer, and a disc pack holder, pivotally supported on said lid for opening away from said lid and being of U shape in cross section along a line parallel to the direction of cartridge insertion, said disc pack holder being capable of receiving therein said magnetic disc pack, said magnetic disc pack incorporating a magnetic disc therein, and wherein said device further comprises:

an opening formed at one side face of said U shaped disc pack holder; and

an engaging member,

means for mounting said engaging member on said disc pack holder side face in juxtaposition to said opening formed in said one side face,

said engaging member having a portion projectable into said opening or retractable therefrom and engageable with said disc pack, and means operatively engaging both said lid and said engaging member and responsive to lid opening for causing said engaging member portion to project into said opening to engage said disc pack to restrain said magnetic disc pack in said disc pack holder when said lid

is opened, and responsive to lid closing to retract said engaging member portion from said opening in said one side face of said U shaped disc pack holder to release the restraint of said magnetic disc pack when the lid is closed and wherein said engaging member is rockably supported on said one side face of said U shaped disc pack holder; and a push member is mounted to said lid and has an end remote from said lid including means in contact with said engaging member for pushing one side of said engaging member to rock said engaging member in a first direction to cause said engaging member portion to be inserted into said opening of the disc pack holder when said lid is opened, and for pushing the other side of said engaging member to rock said engaging member in a second direction upon closing of said lid, so that said engaging member portion is retracted from said opening within the one side face of said U shaped disc pack holder to release the restraint of said magnetic disc pack.

4,694,363

MAGNETIC DISC COUPLING MECHANISM FOR DISC DRIVE UNIT

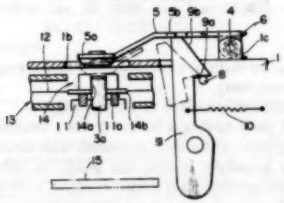
Masao Nakamori, Kawaguchi, and Harunobu Ichinose, Tokyo, both of Japan, assignors to Copal Company Limited, Japan

Filed Nov. 7, 1985, Ser. No. 795,770

Claims priority, application Japan, Nov. 12, 1984, 59-238063

Int. Cl.[4] G11B *17/04*

U.S. Cl. 360—99 **8 Claims**



1. A magnetic disc coupling mechanism for use in a disc drive unit for driving a flexible magnetic disc rotatably accommodated by a disc cassette and having a center core exposed through a window formed in a wall of said disc cassette, said center core being provided with a hole for forcibly fitting around a spindle shaft and also with a magnetic member, said magnetic disc coupling mechanism comprising:

(a) a spindle means adapted for rotatively driving said magnetic disc and including said spindle shaft for forcibly fitting in said hole in said center core of said magnetic disc, and a permanent magnet for attracting said magnetic member of said center core;

(b) a housing for accommodating said disc cassette and movable towards and away from said spindle means, said housing being biased by a first spring away from said spindle means;

(c) a locking member for locking said housing at a drive position where said housing is near said spindle means; and

(d) a forcible pressing member adapted to press said center core of said magnetic disc in said disc cassette accommodated by said housing, said forcible pressing member being biased by a second spring in such a direction as to press said center core towards said spindle member;

wherein said forcible pressing member presses said center core of said magnetic disc such that said spindle shaft is forcibly fitted in said hole in said center core in the final region of the stroking of said housing to said drive position and, thereafter, said locking member causes said forcible pressing member to be moved away from said center core during locking of said housing in said drive position.

4,694,364

INTEGRAL DOOR AND MAGNETIC SHEET PACK HOLDER FOR USE IN A MAGNETIC RECORDING/REPRODUCING APPARATUS

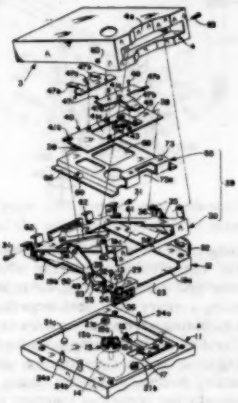
Shinichi Matsuda, Saitama, and Shigenori Oosaka, Kanagawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 4, 1985, Ser. No. 719,998

Claims priority, application Japan, Apr. 11, 1984, 59-70752; Apr. 11, 1984, 59-70753; Apr. 16, 1984, 59-54778[U]

Int. Cl.[4] G11B *17/032, 17/32*

U.S. Cl. 360—99 **8 Claims**



1. A magnetic recording/reproducing apparatus comprising: a body; a door which swings so as to open and close with respect to the body of the apparatus; a spindle which engages an opening of a magnetic sheet placed in the apparatus so as to rotate said magnetic sheet; a magnetic head and a head feeding means, such that said magnetic head is moved in a radial direction with respect to said magnetic sheet by said head feeding means; a pack receiving portion with an opening to receive a magnetic sheet pack rotatably containing said magnetic sheet therein, said door and said pack receiving portion being integrally formed and rotatable around a shaft, such that said door and said pack receiving portion may be swung to an open position away from said body of said apparatus and may be swung back to a closed position flush with said body, wherein the door is locked in a closed position with said body of the apparatus by a locking means after insertion of a magnetic sheet pack so that said magnetic sheet is mounted on said spindle and simultaneously said magnetic sheet is in contact with said magnetic head; said apparatus further comprising:

an oscillating member rotatably supported on a second shaft extending through a hole in said pack receiving portion;

wherein when said pack receiving portion and said door integrally move toward said closed position said oscillating member oscillates toward a use position wherein said magnetic sheet is in contact with said magnetic head, said oscillating member oscillating toward a non-use position when said door is in an open position wherein said magnetic head is out of contact with said magnetic sheet; and

a control plate mounted on a control plate holder, said holder including a holder shaft disposed in a hole in an upper end of said oscillating member such that when said oscillating member oscillates towards a use position, said control plate holder is brought downward to cause said control plate to enter into said magnetic pack receiving portion to give access to the magnetic sheet from a side opposite the magnetic head with respect to said magnetic head such that said magnetic sheet is disposed therebetween when said oscillating member is oscillated towards

said closed use position, the head control plate moving away from said pack receiving portion when said oscillating member is moved toward said open non-use position.

4,694,365

RECORDING MEDIUM FOR RECORDING AND/OR REPRODUCING APPARATUS

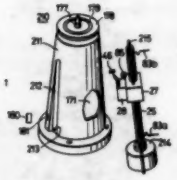
Hisao Kinjo, Yokohama, Japan, assignor to Victor Company of Japan, Tokyo, Japan

Filed Dec. 9, 1985, Ser. No. 806,671

Claims priority, application Japan, Oct. 27, 1981, 56-171868; Aug. 2, 1982, 57-134930

Int. Cl.[4] G11B *5/004*

U.S. Cl. 360—100 **15 Claims**



1. A recording medium which is user-replaceable for a recording and/or reproducing apparatus which comprises a rotational motor and recording and/or reproducing means, said motor having a rotary shaft, said recording and/or reproducing means including a recording and/or reproducing transducer, said recording medium being accommodated within an accommodating case which constitutes a cartridge together with said recording medium and being loaded into said recording and/or reproducing apparatus together with said accommodating case, said accommodating case comprising a window into which said recording and/or reproducing transducer enters, said window having an elongated shape extending in a moving direction of said recording and/or reproducing transducer, said recording medium comprising:

a solid main body molded from a synthetic resin, said main body having opposite ends and including a hollow tapered part having a central axis, said tapered part being open at one of said ends of said main body, said main body having a diameter at said one open end which is greater than the diameter of said main body at the other end, said tapered part having a peripheral surface with a recording surface thereon; and

magnetic coupling means on said other end of said main body for user-replaceably magnetically coupling said recording medium to the rotary shaft of said motor.

7. A recording medium which is user-replaceable for a recording and/or reproducing apparatus which comprises a rotational motor and recording and/or reproducing means, said motor having a rotary shaft, said recording medium comprising:

a solid main body molded from a synthetic resin, said main body having opposite ends and including a hollow tapered part having a central axis, said tapered part being open at one of said ends of said main body, said main body having a diameter at said one open end which is greater than the diameter of said main body at the other end, said main body including an end part closing said hollow part at said other end, said end part being provided with shaft receiving means at a center thereof which engages with a tip end part of the rotary shaft of said motor, said tapered part having a peripheral surface with a recording surface thereon; and

magnetic coupling means on said other end of said main body for user-replaceably magnetically coupling said recording medium to the rotary shaft of said motor.

14. A recording medium which is user-replaceable for a recording and/or reproducing apparatus which comprises a rotational motor and recording and/or reproducing means, said motor having a rotary shaft, said recording medium comprising:

a solid main body molded from a synthetic resin, said main body having opposite ends and including a hollow tapered part having a central axis, said tapered part being open at one of said ends of said main body, said main body having a diameter at said one open end which is greater than the diameter of said main body at the other end, said tapered part having a truncated conical shaped having an angle of taper 1° to 4° so as to be substantially cylindrical, said tapered part having a peripheral surface with a recording surface thereon; and

magnetic coupling means on said other end of said main body for user-replaceably magnetically coupling said recording medium to the rotary shaft of said motor.

4,694,366

DEVICE FOR SHIFTING CARRIAGE

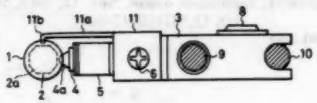
Takamichi Fuke, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Feb. 10, 1986, Ser. No. 828,204

Claims priority, application Japan, Feb. 8, 1985, 60-16646[U]

Int. Cl.[4] G11B *5/55, 21/08*

U.S. Cl. 360—106 **4 Claims**



1. A device for shifting a carriage on which a magnetic head is carried, comprising:

a mating element mounted to the carriage;

a threaded shaft having a helical groove extending around the periphery of the shaft provided with discrete groove portions angularly spaced one after the other in steps which are incrementally offset along an axial direction of the shaft, wherein the mating element engages in resilient contact in the helical groove against a wall defining the groove portions, the carriage being moved in incremental steps in the axial direction by rotating the shaft; and

a retaining member mounted on the carriage and having a retaining portion extending immediately adjacent to but not in contact with the wall defining the groove portions of the helical groove,

whereby in the event of an external shock acting to dislodge the mating element away from the helical groove, the masting element is prevented from disengaging from the groove because the retaining member bears against the wall of the groove.

4,694,367

MECHANISM FOR MOVING RECORDING HEADS ACROSS COMPUTER TAPES

George I. Brent, Boulder, Colo., assignor to Tallgrass Technologies, Inc., Overland Park, Kans.

Filed Nov. 15, 1985, Ser. No. 798,795

Int. Cl.[4] G11B *5/55, 21/08*

U.S. Cl. 360—106 **20 Claims**

1. A mechanism for moving a magnetic recording head across a tape storage medium, said mechanism comprising:

a fixed base;

an actuator on said base having an extensible and retractable output shaft;

an elongate flexible cable having opposite first and second ends;

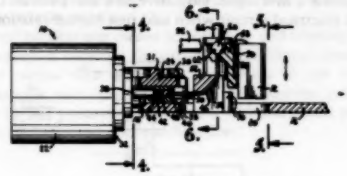
means for coupling said first end of the cable with said shaft;

cable guide means on said base for guiding said cable

through a bend of substantially 90° between said first and second ends;

a bracket carrying the recording head thereon, said bracket being coupled with said second end of the cable;

means for mounting said bracket on said base in a manner restricting the bracket to linear movement in a direction



generally transverse to the tape and perpendicular to the direction of movement of said actuator shaft; and

means for maintaining said cable in a tense condition to effect movement of said bracket and recording head across the tape in opposite directions when said actuator extends and retracts said shaft.

4,694,368

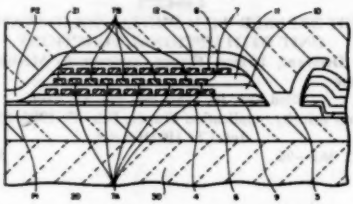
THIN FILM MAGNETIC HEAD WITH THREE SUPERIMPOSED COILS

Peter G. Bischoff, Cupertino; David J. Rauch, Milpitas; Vincent D. Retort, Cupertino, and John R. Osborne, Saratoga, all of Calif., assignors to Read-Rite Corporation, Milpitas, Calif.

Filed Jan. 10, 1986, Ser. No. 817,621

Int. Cl.⁴ G11B *5/31, 5/17*

U.S. Cl. 360—126 **8 Claims**



1. A thin film magnetic head assembly comprising:

a nonmagnetic substrate;

first and second magnetic pole piece layers deposited over said substrate;

nonmagnetic insulating material disposed between said pole piece layers, said material forming a transducing gap;

said pole pieces being connected to form a back gap closure; and

an electrically conductive coil assembly including upper and lower layers of coil turns, and a central layer of coil turns disposed between said upper and lower layers of coil turns, said central layer being bifilar, said coil assembly being disposed in said nonmagnetic insulating material and between said pole piece layers.

4,694,369

SEPARABLE WEB CONTAINER

Donald L. Ramsay, 6881 Hazard, Westminister, Calif. 92683

Filed Mar. 14, 1985, Ser. No. 711,742

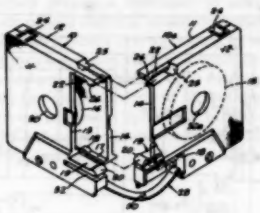
Int. Cl.⁴ G11B *23/02*; G03B *1/04*

U.S. Cl. 360—132 **4 Claims**

1. A thin film web container assembled from two identical halves separable along a central vertical line, each of said halves comprising:

a front section on which there is a flexible extension at the top thereof, said top extension having a downward projecting semicircular tab at the end thereof, said front section also having a bottom flexible extension with an upwardly projecting semicircular tab thereon;

a rear section attached to said front section, said rear section extending beyond said front section and including in the top and bottom thereof semicircular indentations matching said upwardly and said downwardly projecting semicircular tabs, so that when an identical pair of halves are assembled together, said downwardly and said upwardly extending semicircular tabs on said front section of said



front half engage said semicircular indentations of said rear section of the other half to hold the identical halves together in mirror image fashion; and

each of said halves including between their front and back sections a reel rotatably disposed therein to hold a thin film web rolled up thereon,

said identical halves being easily separable by pulling the halves apart against the flexible extensions engaged in the indentations, so that said web may be accessed to insert or delete portions thereof as desired.

4,694,370

MAGNETIC DISK CARTRIDGE

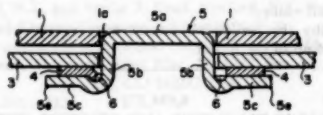
Shozo Ommori, and Kengo Oishi, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Jun. 20, 1985, Ser. No. 746,962

Claims priority, application Japan, Jun. 22, 1984, 59-93387[U]

Int. Cl.⁴ G11B *23/03*

U.S. Cl. 360—133 **5 Claims**



1. A rotatable magnetic disk assembly comprising:

a magnetic disk having a centrally disposed opening therethrough,

an adhesive member and

a center core; said center core comprising a cylindrical member having an outer periphery which is receivable into said central opening in said magnetic disk and a flange radially extending from near an axial end of said cylindrical member, which flange has a face which is proximate to said magnetic disk and which is affixed to said magnetic disk by means of said adhesive member, said face having a circumferential groove therein substantially adjacent to said outer periphery of said cylindrical member so that if said adhesive member is misaligned with respect to said cylindrical member within a tolerance, a portion of said adhesive member can enter said groove to reduce deformation of the magnetic disk.

4,694,371

PROTECTION CIRCUIT FOR STALLING PROTECTION IN COMMUTATORLESS DIRECT CURRENT MOTORS

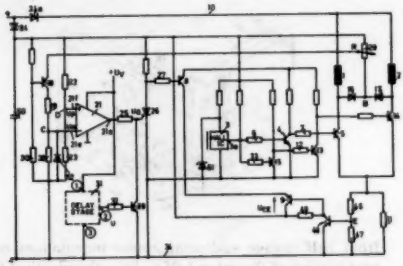
Wilhelm Reinhardt, Schrozberg-Guetbach, and Helmut Lipp, Hohebach, both of Fed. Rep. of Germany, assignors to ebm Elektrobau Mulfingen GmbH & Co., Fed. Rep. of Germany

Filed May 3, 1985, Ser. No. 730,199

Claims priority, application Fed. Rep. of Germany, May 17, 1984, 3418276

Int. Cl.[4] H02H *7/09*

U.S. Cl. 361—23 **11 Claims**



1. A protection circuit which protects against stalling in a commutatorless direct current motor having a plurality of stator windings receiving an operating voltage and being selectively energized, comprising:

respective semiconductor circuit elements disposed in series with each stator winding and operative to be turned on or off in response to a control voltage induced in said stator windings, said control voltage being the sum of the operating voltage in the unenergized stator windings and the counter-e.m.f. induced in said unenergized windings;

means responsive to said control voltage to turn on the respective semiconductor circuit element connected to the energized stator winding if said control voltage is greater than said operating voltage, and to turn off said respective semiconductor circuit element if said counter-e.m.f. falls below a predetermined cutoff value; and

a start-up bridging circuit operative in response to initial application of the operating voltage to the motor to override said means and maintain said respective semiconductor circuit elements turned on for a time interval sufficient for the counter-e.m.f. to build up to said predetermined cutoff value,

whereby the protective circuit does not prevent normal start-up of the motor.

4,694,372

CIRCUIT DIAGNOSIS AND CONTROL DEVICE

Jean-Paul Sibeud, Chaponnay (rhone), France

Continuation of Ser. No. 444,568, Nov. 26, 1982, abandoned. This application Jun. 13, 1985, Ser. No. 744,297

Claims priority, application France, Nov. 25, 1981, 81 22454

Int. Cl.[4] H02H *3/24*

U.S. Cl. 361—86 **14 Claims**

1. A control, inspection and safety device in an electrical circuit receiving electrical power from a direct current source, comprising:

a MOS power transistor having a source and a drain connected in series between said current source and said electrical circuit, and a gate, said MOS power transistor being selected such that the drain to source saturation current I_{SAT} is higher than the current corresponding to the nominal current of said electrical circuit; and

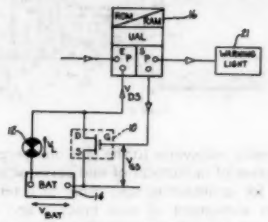
a microprocessor having means for applying a gate to source voltage V_{GS} to said gate to render said MOS transistor conductive in response to an external command and to periodically test a first logical relation:

$$V_{GS} \neq 0$$

and

$$V_{DS} > |V_{BAT}$$

to generate a first signal indicative of a short circuit condition in said electrical circuit when said first logical relation is satisfied where V_{DS} is the voltage between said drain and said source of said MOS transistor and V_{BAT} is the nominal voltage at the terminals of said current source, said microprocessor further having means for terminating the application of said gate to source voltage V_{GS} to said gate for a first predetermined period of time in response to each time the test of said first logical relationship is satisfied and means responsive to the expiration of said first predetermined period of time for reapplying said voltage V_{GS} to said gate and to retest said first logical relationship.



4,694,373

CIRCUIT BREAKER WITH DIGITAL SOLID-STATE TRIP UNIT WITH OPTIONAL FUNCTIONS

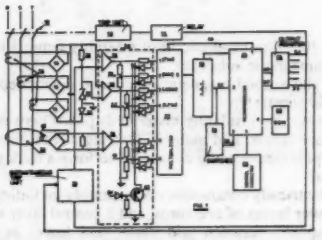
Pierre Demeyer, Uriage, France, assignor to Merlin Gerin, France

Filed Feb. 10, 1986, Ser. No. 827,440

Claims priority, application France, Feb. 25, 1985, 85 03162

Int. Cl.[4] H02H *3/08*

U.S. Cl. 361—96 **5 Claims**



1. A digital solid-state trip unit for an electrical circuit breaker comprising:

current sensor means for generating analog signals proportional to currents flowing through conductors protected by the circuit breaker,

rectifier circuit means for rectifying said signals and for providing a continuous analog signal representative of a maximum value of said currents,

an analog-to-digital converter means having an input receiving said analog signal and an output for producing a corresponding sampled digitized signal,

microprocessor-based digital processing unit means, to which the digitized signal is applied for providing a long delay trip function and a short delay trip function and for

generating a circuit breaker tripping order, when present pick-ups are exceeded by said digitized signal, said order being time delayed in terms of the value of the digitized signal, said digitized processing unit also selectively providing a ground fault protection optional function and a load shedding and restoring optional function, said ground fault or load shedding optional functions being performed by selecting a respective execution program stored in non-volitile memory,

a circuit breaker trip means activated by said tripping order,

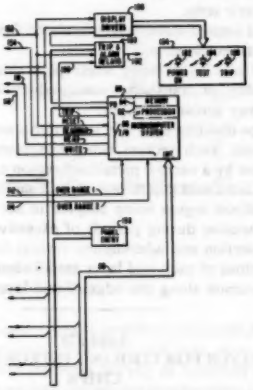
a plurality of switches for providing the digital processing unit means with execution parameters of the tripping functions, and optional function switches for providing the digital processing unit means with execution parameters of a selected optional function.

4,694,374

PROGRAMMED OVEREXCITATION PROTECTIVE RELAY AND METHOD OF OPERATING THE SAME

William R. Verbanets, Jr., Plum Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 26, 1985, Ser. No. 727,697
Int. Cl.[4] H02H 7/09
U.S. Cl. 361—96 **17 Claims**



1. A programmed protective relay for protecting power equipment, supplied with energy from at least one power line, against overexcitation by deriving an overexcitation time-to-trip based on a selectable relationship of the ratio of voltage/-frequency of an energy supplying power line, said protective relay comprising:

a programmed digital signal processor;

memory means, coupled to said programmed processor, for storing a plurality of digitally coded signals representative of predetermined derivation constants;

means for setting a plurality of derivation parameters;

means for measuring the voltge of an energy suplying power line and generating at least one signal representative thereof;

means governed by said programmed processor to sample said voltage measurement signal at first predetermined times and to digitize said sampled voltage measurement signals, a frequency cycle of a power line voltage including a plurality of first predetermined times;

means for generating interrupts to said programmed processor based on the voltage frequency cycles of said voltage measurement signal;

said programmed processor responsive to said generated interrupts to derive first digital signals, representative of the voltage/frequency ratio of said voltage measurement signal, corresponding to each interrupt, from the sampled voltage measurement signals digitized over the corresponding inter-interrupt periods;

said programmed processor operative over predetermined time intervals, each including a plurality of inter-interrupt periods, to derive for each predetermined time interval a second digital signal, representative of an overall voltage/frequency ratio value X_1, from the first digital signals derived over the corresponding predetermined time interval i;

said programmed processor operative at times corresponding to said predetermined time intervals to read said parameter settings;

said programmed processor operative to select, at other times, certain of said digitally coded derivation constants from said memory means corresponding to said read parameter settings associated with said other times;

said programmed processor operative to detect an overexcitation condition from said derived second digital signals;

said programmed processor operative, in response to the detection of an overexcitation condition, to derive an overexcitation time-to-trip based on the following relationship:

$$\sum_{i=1}^{N} \exp\left[\frac{1}{C}(X_i - 1)\right] \geq L$$

where i from 1 to N represent the predetermined time intervals during which said detected overexcitation condition persists;

where 1/C and L represent digitally coded derivation constants based on said read parameter settings for each corresponding predetermined time interval i;

where N represents the number of predetermined time intervals which may elapse for the time-to-trip beyond a minimum number of predetermined time intervals for the time-to-trip;

where X_1 represents the second digital signal derived from the corresponding predetermined time interval i; and

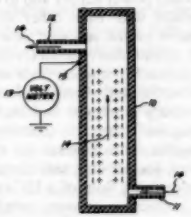
means for governing the interruption of energy to said power equipment if said overexcitation condition persists for the duration of said time-to-trip derivation.

4,694,375

ADDITIVES TO PREVENT ELECTROSTATIC CHARGE BUILDUP IN FLUIDS IN HIGH VOLTAGE SYSTEMS

John C. Devins, Burnt Hills, N.Y.; Matthew A. Dranchak, Mt. Laurel, N.J., and Stefan J. Rzad, Rexford, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 140,244, Apr. 14, 1980, abandoned. This application Mar. 22, 1982, Ser. No. 360,264
Int. Cl.[4] H01G 1/08
U.S. Cl. 361—212 **16 Claims**



1. A fluid mixture for use in coolant flow conduits of high voltage electrical equipment coolant systems, said mixture comprising a nonflammable insulating halocarbon liquid coolant in combination with at least one ionic additive in an amount effective to increase the electrical conductivity of said mixture,

but insufficient to impair its electrical insulating function, said additive being soluble in said coolant.

4,694,376

CIRCUIT FOR THE PULSED OPERATION OF ONE OR MORE HIGH-FREQUENCY OZONIZERS

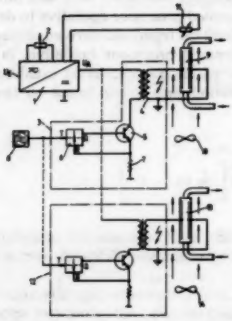
Rudolf Gesslauer, Waldstr. 6, 3501 Schauenburg, Fed. Rep. of Germany

Continuation of Ser. No. 471,358, Mar. 2, 1983, abandoned. This application Sep. 26, 1985, Ser. No. 781,201

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1982, 3208895

Int. Cl.[4] B03C 3/01

U.S. Cl. 361—235 11 Claims



1. A circuit arrangement for the pulsed operation of a plurality of high frequency ozonizers of a given type but each of which may have different characteristics due to manufacturing differences caused by manufacturing tolerences, comprising; a DC voltage supply means having at least one output for delivering a DC voltage and an adjusting means for adjusting said DC voltage; a frequency control means connected to all of said ozonizers for producing current pulses of a defined frequency to all of said ozonizers; a plurality of high voltage transformers, each transformer having a primary winding coupled to an output of said DC voltage supply means and a secondary winding coupled to a respective one of said ozonizers; and a plurality of pulse width control circuits, each circuit associated with one of said ozonizers for controlling the transformer of each ozonizer to operate at a preselected repetition frequency and at a preselected duty ratio adjusted a predetermined amount and causing each ozonizer to operate at an optimum energy output efficiency, said plurality of ozonizers each having its high voltage transformer primary winding connected to said power supply and its pulse width control circuit connected to said frequency control means so that said ozonizer connections to said power supply and to said frequency control means are parallel with each other to be operated by said frequency control means and said power supply, each pulse width control circuit deriving electrical current pulses of a preselected repetition frequency from said DC voltage supply means and delivering said current pulses through a respective one of said primary windings, and each pulse width control circuit including said respective primary winding and an individual pulse width control means for each circuit having an electronic switch for deriving said electrical current pulses by blocking or releasing a flow of a DC current from its output through said respective primary winding and each circuit further having means coupled to said electronic switch for alternately switching said switch into a blocking or a releasing condition at said pre-selected repetition frequency and at a pre-selectable duty ratio such that said current pulses may be delivered through each of said primary windings at pre-selectable duty ratios, wherein said adjusting means serve to adjust a desired overall amount of production of ozone per time unit from all of said ozonizers by adjusting the same DC voltage for all of said primary windings, whereby said pulse width control means serve to individually control the amount of energy expended for each of said ozonizers.

4,694,377

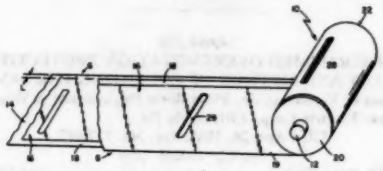
SEGMENTED CAPACITOR

Frederick W. MacDougall, Marion, and Thomas A. Murphy, New Bedford, both of Mass., assignors to Aerovox Incorporated, New Bedford, Mass.

Filed May 28, 1986, Ser. No. 868,295

Int. Cl.[4] H01G 1/11

U.S. Cl. 361—275 13 Claims



1. A capacitor comprising:

a dielectric strip,

first and second metal layers insulated from one another by said dielectric strip,

each of said layers being interrupted along its length by a plurality of transverse non-conductive gaps extending partway across said layer,

said gaps dividing each said layer into a series of conductive sections, each section being connected to an adjacent section by a narrow metallized region extending from the associated said gap to one edge of said layer, said narrow metallized region being adapted to act as a first fuse for said section during periods of excessive current flow to said section and wherein

the sections of each said layer are all electrically connected in common along one edge of said layer.

4,694,378

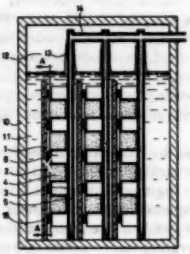
APPARATUS FOR COOLING INTEGRATED CIRCUIT CHIPS

Wataru Nakayama, Kashiwa; Shigeki Hirasawa, and Tadakatsu Nakajima, both of Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 684,790, Dec. 21, 1984, abandoned. This application Jan. 2, 1987, Ser. No. 128

Int. Cl.[4] H05K 7/20

U.S. Cl. 361—385 4 Claims



1. In a cooling apparatus cooling, by a boiling action of a dielectric liquid, integrated circuit chips mounted on printed circuit cards, each printed circuit card being submerged longitudinally in the dielectric liquid with a space provided therebe-

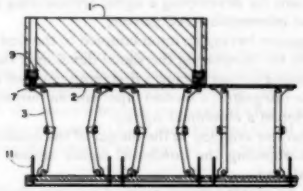
tween, the cooling apparatus comprising stud means formed of a heat conductive material attached to a surface of respective integrated circuit chips promoting a boiling action to enhance a heat transfer efficiency to the dielectric liquid; cooling plate means arranged adjacent printed circuit cards in the cooling apparatus, the cooling plate means being cooled by a circulating cooling medium; a plurality of fin means attached to the cooling plate are formed of heat conductive material, and surround the circumference of each of the respective stud means; and a plurality of resilient members surrounding the respective stud means whereby vapor bubbles produced at lower integrated circuit chips or the stud means are trapped between the fin means and condensed such that vapor bubbles will not enter an area of another integrated circuit chips or stud means.

4,694,379

CONTROL PANEL FOR ELECTRONIC INSTRUMENTS

Peter J. Unger, Beaverton, and Jon C. Mutton, Milwaukie, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 4, 1985, Ser. No. 698,211
Int. Cl.⁴ H02B 1/04
U.S. Cl. 367—419 **5 Claims**



1. A control panel system, comprising,
a subunit electronic device,
at least one planar cover plate,
a base plate,
a plurality of hinged support members supporting said at least one planar cover plate from said base plate,
said hinged support members having an extended position wherein said support members are substantially locked in an over center configuration, and
means provided on said subunit electronic device for unlocking said support members when said subunit electronic device is urged toward said cover plate, and wherein said unlocking means comprises means protruding from said subunit electronic device, and wherein said support members are provided with arm portions engageable by said unlocking means for rotating said support members out of said over center configuration, and, further wherein said at least one planar cover plate is perforated with holes through which said unlocking means are received to engage said support members.

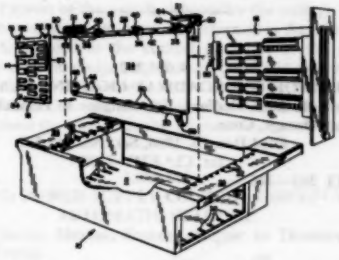
4,694,380

CARRIER TRAY FOR CIRCUIT BOARD

Robert L. Mallory, Portland; Alfred H. Schamel, West Linn, both of Oreg., and Stephen M. Sekel, Vancouver, Wash., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 11, 1986, Ser. No. 873,000
Int. Cl.⁴ H05K 9/00
U.S. Cl. 361—424 **5 Claims**

1. A carrier tray carrying and shielding a circuit board assembly used in electrical equipment comprising; a metal plate, an upper plastic molded rail affixed to the metal plate along the top edge thereof and a lower plastic molded rail affixed to the metal plate along the bottom edge thereof, fastening means molded into the upper and lower rails, a circuit board assembly having top and bottom edges, and said fastening means fastening said top and bottom edges of the circuit board assembly to the rails in spaced relation to the metal plate.

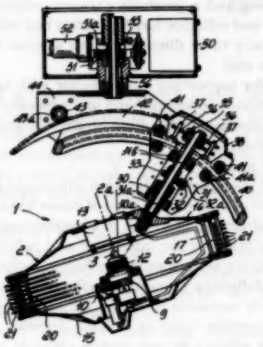


4,694,381

LIGHT PROJECTOR FOR MOVABLE OPTICAL EFFECTS

Bruno Dedoro, Castel Goffredo, Italy, assignor to Coemar S.p.A., Castel Goffredo MN, Italy

Filed Mar. 3, 1986, Ser. No. 835,382
Claims priority, application Italy, Mar. 21, 1985, 19988 A/85
Int. Cl.⁴ F21V 7/00
U.S. Cl. 362—307 **17 Claims**



1. A light projector for movable optical effects comprising:
a light source,
a rotating shutter of substantially tubular shape surrounding said light source for partially passing light coming from said light source and emitting light beams,
a hollow body enclosing said light source and said rotating shutter, said hollow body including first and second substantially disk-like shaped support shells extending opposed to and at a distance from each other, and a lateral wall of substantially tubular shape extending between said first and second support shells coaxially to said rotating shutter, said lateral wall including a focusing lens extending all around said rotating shutter for receiving and focusing said light beams emitted by said rotating shutter,
support means in said enclosing body, rigidly connected to said first support shell and said light source and rotatively connected to said rotating shutter,
motor drive means in said enclosing body resting on said first support shell, said motor drive means being connected to and rotatively driving said rotating shutter, and

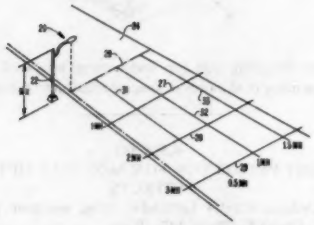
a hanging arm connected to and extending from said hollow body for hangingly supporting said hollow body.

4,694,382

REFLECTOR FOR ROADWAY LIGHTING LUMINAIRE

Kenneth B. Sales, Radford, Va., assignor to Hubbell Incorporated, Orange, Conn.

Filed Dec. 23, 1986, Ser. No. 945,528
Int. Cl.[4] F21V 7/00
U.S. Cl. 362—346 4 Claims



1. A luminaire for providing a predetermined pattern of illumination of an area such as a portion of a roadway with the luminaire supported above and adjacent to one side edge of the roadway comprising

a reflector having an edge defining an elongated bottom opening and a generally concave interior reflective surface, said reflector having a street end oriented toward the roadway to be illuminated and a house end opposite the street end;

means for supporting said reflector with said edge defining said bottom opening lying in a generally horizontal plane at a preselected mounting beight MH above the surface of said roadway;

a lamp; and

means for supporting said lamp within said reflector with the center of illumination thereof closer to said house end than said street end and lying in a longitudinal, central, vertical plane bisecting the interior of said reflector;

said interior surface of said reflector including

means defining a plurality of reflective facets arranged in an orderly sequence of bands, the surface of each said facet substantially lying in a plane forming a predetermined angle relative to said central plane to reflect light from said lamp toward a predetermined location on said roadway surface,

said bands forming first and second groups of bands, each group including a plurality of bands and each band including a plurality of facets, said groups of bands being disposed on opposite sides of a transverse plane perpendicular to said central vertical plane,

each band in said first group of bands lying toward said street end from said transverse plane extending arcuately from one side of said bottom edge to the other, the facets of each said band being set at angles to reflect light from said lamp primarily downwardly and generally laterally of the reflector along said roadway,

each band in said second group being toward the house end of said reflector from said transverse plane and lying between planes making angles of about 45° with the plane containing said bottom edge, and

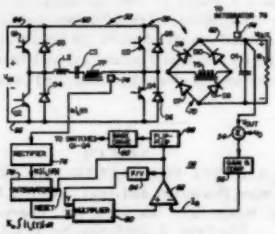
substantially all of said facets of said bands in said second group being set at angles to reflect light from said lamp downwardly and laterally of said reflector and away from the edge of said roadway adjacent said luminaire.

4,694,383

CONTROLLER FOR A RESONANT CONVERTER

Vietson M. Nguyen, and P. John Dhyanchand, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 15, 1986, Ser. No. 907,581
Int. Cl.[4] H02M 3/337
U.S. Cl. 363—17 18 Claims



1. A controller for a resonant DC/DC converter having at least one power switch which is controlled to develop intermediate AC power in a resonant circuit, comprising:

first means for developing a signal representing a parameter of the intermediate AC power;

an integrator having an input coupled to the first developing means for integrating the signal developed thereby;

a combining circuit having a first input coupled to an output of the integrator, a second input and an output at which is developed a combined signal;

a comparator coupled to the output of the combining circuit for comparing the combined signal against a reference signal; and

second developing means coupled between the output of the comparator and a second input of the combining circuit for developing a feedback signal which represents the frequency of the comparator output and which is combined by the combining circuit with the output of the integrator to derive the combined signal;

whereby the comparator develops signals which are used to control the switch in the resonant converter.

4,694,384

HVIC POWER SUPPLY CONTROLLER WITH PRIMARY-SIDE EDGE DETECTOR

Robert L. Steigerwald, Scotia, N.Y.; Kevin C. Routh, Durham, N.C.; Glenn S. Claydon, Wynantskill, and William H. Bicknell, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 4, 1986, Ser. No. 938,089
Int. Cl.[4] G05F 1/56; H02M 3/335
U.S. Cl. 363—17 21 Claims

1. A power supply for converting a first DC potential to a second DC potential of predetermined amplitude, comprising:

primary side means for receiving the first DC potential with respect to a primary side common potential;

chopper means for converting the first DC potential at the primary side receiving means to a chopped signal with a periodically varying amplitude;

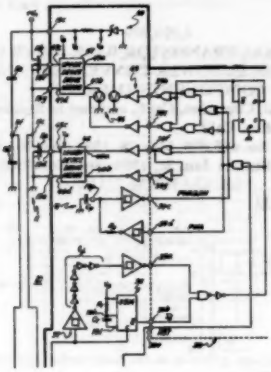
a potential transformer having a primary winding, receiving from the chopper means the chopped signal with respect to said primary side common potential, and a secondary winding providing on a secondary side a secondary signal, with respect to a secondary side common potential which is isolated from said primary side common potential, with said secondary signal having an amplitude responsive to at least one characteristic of the chopped signal received by the primary winding;

means for converting the secondary signal to at least the second potential;

means for providing a sequential digital data signal indica-

tive of the magnitude and polarity of the error of the actual second potential with respect to the predetermined second potential amplitude;

means for isolatively coupling the digital data signal from the secondary side to the primary side of the power supply; and



means, including a digital data edge detector for recovering each data bit of the digital data signal, on the primary side, responsive substantially only to each edge transition thereof, for controlling the operational characteristics of said chopper means to vary the chopped signal in manner to reduce the error of said second DC potential.

4,694,385

SWITCHED-MODE POWER SUPPLY WITH DELAY NETWORK TO REDUCE SWITCHING LOSSES

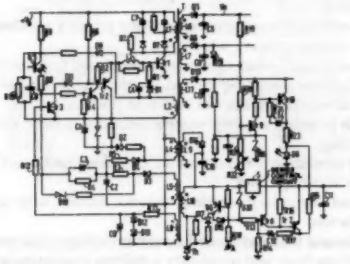
Antonius A. Marinus, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 30, 1986, Ser. No. 890,593

Claims priority, application Netherlands, Aug. 26, 1985, 8502339

Int. Cl.[4] H02M *3/335*

U.S. Cl. 363—19 **12 Claims**



1. A switched-mode power supply circuit for converting a d.c. input voltage into a d.c. output voltage comprising: a controllable power switch connected in a series arrangement with a primary winding of a transformer, means coupling the series arrangement to input voltage terminals, said transformer having a secondary winding to which a rectifier is coupled for providing the output voltage, the primary winding forming part of a resonant circuit when the switch and rectifier pass no current, a drive circuit including a delay network connected to a control electrode of the switch for each time initiating turn-off of the switch, whereafter the voltage across the switch increases to a given value and substantially maintains said value, whereafter the said voltage decreases in accordance with an oscillation at a resonance frequency, and for each time initiating turn-on of the switch, whereafter the voltage across the switch is substantially zero, characterized in that the delay network is coupled to the control electrode of the power switch for each time adjusting the turn-on of said switch at an instant which is substantially half a cycle of the resonance frequency later than the initial instant of the decrease of the voltage across the switch during its previous cut-off time.

4,694,386

CHOPPED POWER SUPPLY CONTROL CIRCUIT WITH AUTOMATIC START-UP

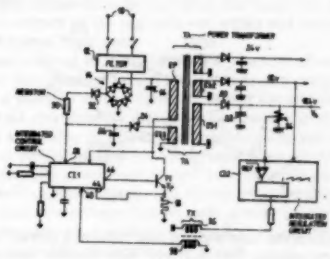
Jean de Sartre, Meylan, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 7, 1986, Ser. No. 827,147

Claims priority, application France, Feb. 8, 1985, 85 01823

Int. Cl.[4] H02P *13/22*

U.S. Cl. 363—49 **7 Claims**



1. A chopped power supply control circuit intended to receive periodic regulation control signals and to produce periodic square waves enabling a main switch of the power supply, the square waves having a variable width as a function of their regulation control signals, which circuit comprises:

means for detecting the presence of regulation control signals,

a very low frequency oscillator controlled by the detection means, this oscillator producing, in the absence of regulation signals, a succession of very low frequency periodic cycles, the oscillator being inhibited by the regulation control signal detection means,

a high frequency oscillator producing chopping signals palliating the absence of regulation signals for producing enabling square waves,

an inhibition means for allowing transmission of the chopping siganls to the switch only during a first phase of each very low frequency periodic cycle and for preventing such transmission during the rest of the cycle, the first phase of each cycle having a duration which is long compared with the period of the high frequency oscillator and short compared with the period of the very low frequency oscillator.

4,694,387

INDUCTIVE DEVICES

Charles S. Walker, King County, Wash., assignor to Honeywell, Inc., Minneapolis, Minn.

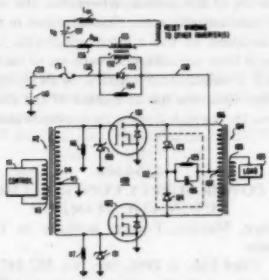
Filed Jan. 8, 1987, Ser. No. 1,610

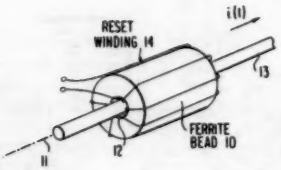
Int. Cl.[4] H02H *7/122*

U.S. Cl. 363—56 **5 Claims**

1. An inductive device for protecting one or more transistors in a power supply composed of a bead of magnetic material, said bead being formed with an axial aperture through which an electrical conductor electrically connected to electrodes of

the transistors is adapted to pass, and a reset winding wound on said bead and connected to a source of constant current for resetting said inductive device so that the maximum volt-





second absorbtion capability of said inductive device is available for preventing destructively high current spikes from flowing through said electrical conductor.

4,694,388

SYNCHRONIZER FOR COMMONLY CLOCKED CONVERTERS

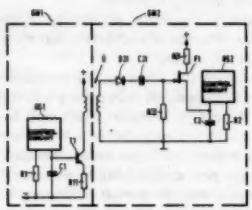
Walter Lösel, Fürth, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 4, 1986, Ser. No. 892,602

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1985, 3528766

Int. Cl.[4] H02M *11/00*

U.S. Cl. 363—72 **7 Claims**



1. An arrangement for synchronizing the oscillators of several clocked direct voltage converters each having a control circuit with the oscillator included as an integrated element, each control circuit having a connection for a capacitor and a connection for a resistor with the capacitor and resistor defining the frequency of its oscillator, characterized in that the frequency of the oscillator of a first direct voltage converter is adjusted to be higher than the frequency of the oscillators of all other direct voltage converters, means for transmitting a pulse sequence, whose impulse frequency is proportional to the frequency of the oscillator of the first direct voltage converter, from the first direct voltage converter through an element providing voltage isolation to all of the other direct voltage converters, wherein the pulses of the pulse sequence adjust a predetermined charging state for the capacitors of the control circuits of all the other direct voltage converters, and wherein the adjustment is repeated at the frequency of the oscillator of the first direct voltage converter.

4,694,389

PROPORTIONAL TRANSISTOR BASE DRIVE CIRCUIT FOR USE IN POWER CONVERTERS AND COMPONENTS THEREOF

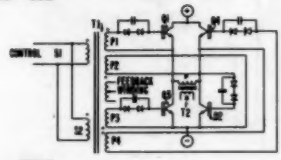
Kenneth T. Small, Cupertino, Calif., assignor to Boschert, Incorporated, Milpitas, Calif.

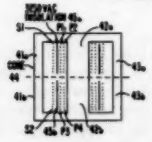
Division of Ser. No. 615,009, May 29, 1984, Pat. No. 4,628,432.

This application Jun. 26, 1986, Ser. No. 878,938

Int. Cl.[4] H02M *7/5387*

U.S. Cl. 363—132 **13 Claims**





1. A transformer comprising:

a core containing a center leg, a first outer leg, a second outer leg, a first cross piece joining a first end of said center leg to a first end of said first outer leg and a first end of said second outer leg, and a second cross piece joining a second end of said center leg with a second end of said first outer leg and a second end of said second outer leg;

a first primary winding wound around a first portion of said center leg but not a second portion of said center leg;

a second primary winding wound around said first primary winding;

first insulation wound around said first primary winding and said second primary winding;

a first secondary winding wound around said first insulation;

a third primary winding wound around said second portion of said center leg but not said first portion;

a fourth primary winding wound around said third primary winding;

second insulation wound around said third and fourth primary windings; and

a second secondary winding wound around said second insulation,

wherein said first and second insulation isolates said primary windings from said secondary windings so as to insure that said transformer meets international safety standards.

4,694,390

MICROPROCESSOR-BASED CONTROL AND DIAGNOSTIC SYSTEM FOR MOTOR OPERATED VALVES

Robert A. S. Lee, Tewksbury, Mass., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jun. 28, 1985, Ser. No. 750,617

Int. Cl.[4] G05B *13/02*; F16K *31/02*

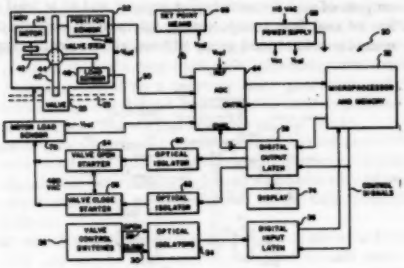
U.S. Cl. 364—165 **22 Claims**

20. A method of controlling a motor operated valve having

a valve stem for opening and closing said valve, and motor means for driving said valve stem so as to controllably open and close said valve; the steps of the method comprising:

measuring the position of said valve stem and producing a valve stem position signal;

measuring the load on said valve stem and producing a valve stem load signal;



periodically, when said valve is being opened, determining the rate of change of the position of said valve stem, and predicting the position of said valve stem at a predefined time in the future in accordance with said rate of change of valve stem position; and

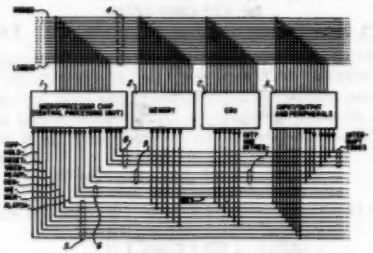
turning off said motor if said predicted valve stem position is beyond a preselected open valve position.

4,694,391

COMPRESSED CONTROL DECODER FOR MICROPROCESSOR SYSTEM

Karl M. Guttag, and Kevin C. McDonough, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 24, 1980, Ser. No. 210,108
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—200 **20 Claims**



1. A microprocessor formed in a face of a semiconductor body comprising:

(a) a rectangular pattern in said face containing an arithmetic logic unit, a plurality of data and address registers, and a plurality of parallel busses, the rectangular pattern having a length and width;

(b) a control ROM in said face having a length and a width, the length of said control ROM being much greater than its width, the length of said control ROM extending alongside the length of said rectangular pattern and being spaced from the rectangular pattern by much less than the width of the rectangular pattern;

(c) said arithmetic logic unit containing N parallel bits with each bit having two inputs and an output, the bits of the arithmetic logic unit extending along said face of the semiconductor body in a line parallel to said width of said rectangular pattern;

(d) said plurality of data and address registers, each containing N parallel bits, each bit having an input and an output, the bits of each of the separate registers being formed in said face, in a line parallel to said width of the rectangular pattern aligned with and corresponding one-to-one with the bits of the arithmetic logic unit,

(e) said plurality of parallel busses, each having N parallel conductor lines, each bus formed at said face and extending in the direction of said length of the rectangular pattern and generally perpendicular to said line of the bits of the arithmetic logic unit and said lines of bits of the registers, each of the parallel conductor lines of a plurality of said busses crossing over a bit of the arithmetic logic unit and at least one of said registers,

(f) a plurality of control lines at said face within said rectangular pattern running generally perpendicular to said busses and parallel to said lines of bits the arithmetic logic unit and registers, the control lines being connected to logic means in the arithmetic logic unit and registers to define connections to and from the busses for the inputs and outputs of the registers and inputs and outputs of the arithmetic logic unit,

(g) said control ROM generating a plurality of control signals for coupling to said control lines and comprising:

(i) a plurality of row lines and means for selecting one of said row lines for activation in response to an address,

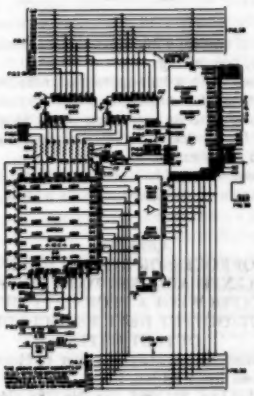
(ii) a plurality of column lines intercepting said row lines to provide an array, the column lines divided into a plurality of separate groups with one group for each of said control signals, and means for selecting no more than one column line in each group for activation in response to an address, the number of column lines per group differing among the groups.

4,694,392

VIDEO DISPLAY CONTROL

Jerry L. Ballard, 3341 Edith La., Haltom City, Tex. 76117; Dale Chatham, 2202 Dennis Rd., Weatherford, Tex. 76084, and Gerald E. Gaulke, 1308 Timber Valley, Lewisville, Tex. 75028

Continuation of Ser. No. 489,262, Apr. 27, 1983, abandoned.
This application Sep. 25, 1985, Ser. No. 779,819
Int. Cl.[4] G06F *3/14*
U.S. Cl. 364—200 **46 Claims**



1. In a microcomputer system, a video controller comprising;

a video memory means for storing video character codes and including means for controlling writing into and

reading therefrom and means defining a memory address and memory data,

a video data bus coupled to said video memory means,

a central processing unit address bus,

a cathode ray tube controller means having address lines,

multiplexer means having first and second input sets and an output set,

means coupling the central processing unit address bus to the first input set,

means coupling the cathode ray tube controller means address lines to the second input set,

means coupling the output set to the video memory means address input,

buffer means coupling said video data bus to a central processing unit data bus for transfer of data between said central processing unit and said video memory means,

and control means for controlling the multiplexer means whereby in one state the video memory means is addressed from the cathode ray tube controller means and in the other state the video memory means is addressed from the central processing unit.

4,694,393

PERIPHERAL UNIT FOR A MICROPROCESSOR SYSTEM

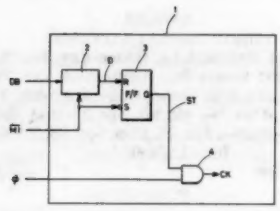
Takaaki Hirano, Nara; Setsufumi Kamuro, Yamatokoriyama; Akira Yamaguchi, Nara; Junichi Tanimoto, Tenri, and Mikiro Okada, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 11, 1984, Ser. No. 619,302

Claims priority, application Japan, Jun. 14, 1983, 58-107215; Jun. 15, 1983, 58-108279

Int. Cl.⁴ G06F *1/04*

U.S. Cl. 364—200 **7 Claims**



1. A peripheral unit for a microprocessor system including a microprocessor, comprising:

means, responsive to a halt-operation instruction from the microprocessor, for outputting a halt-operation signal;

means, responsive to an activation signal from the microprocessor, for producing an internal clock signal for activating said peripheral unit; and

means, responsive to said halt-operation signal, for inhibiting the production of said internal clock signal.

4,694,394

MICROPROCESSOR SYSTEM HAVING A MULTIPLEXED ADDRESS/DATA BUS WHICH COMMUNICATES WITH A PLURALITY OF MEMORY AND INPUT/OUTPUT DEVICES INCLUDING TTL OUTPUT GATES

Giorgio Costantini, Milan, Italy, assignor to Honeywell Information Systems Italia, Milan, Italy

Filed Oct. 10, 1985, Ser. No. 786,376

Claims priority, application Italy, Dec. 12, 1984, 24021 A/84

Int. Cl.⁴ G06F *13/00*

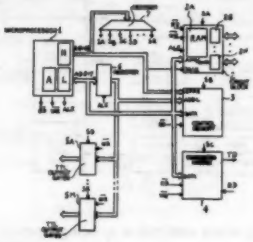
U.S. Cl. 364—200 **3 Claims**

1. A microprocessor system comprising:

a microprocessor having a first group of address lines internally connected to the output of a first address register H, a second group of multiplexed address/data lines internally and selectively connected to the output of a second address register L or of an accumulator and a plurality of control lines;

a demultiplexing register having inputs connected to said second group or multiplexed address/data lines and one of said control lines;

a control memory having address inputs connected to the outputs of said demultiplexing register and to at least one line of said first group, having information outputs connected to said second group of lines, and a selection input;



a plurality of TTL output gates provided with data inputs, one enabling input and control input connected to another one of said control lines;

a decoder having inputs connected to a subset of lines of said first group and a plurality of outputs, each of them respectively connected to the selection input of said control memory and enabling input of said TTL output gates; and

a direct connection between the outputs of said demuliplexing register and the data inputs of said TTL output gates.

4,694,395

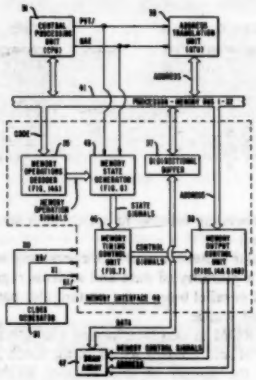
SYSTEM FOR PERFORMING VIRTUAL LOOK-AHEAD MEMORY OPERATIONS

Rocky M. Young, Escondido, and Tri T. Vo, San Diego, both of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 25, 1985, Ser. No. 801,361

Int. Cl.⁴ G06F *12/10*

U.S. Cl. 364—200 **7 Claims**



1. A data processing system comprising:

a memory bus;

processing means coupled to said memory bus for providing during a first cycle either a real address for a real memory operation or a first virtual address for a virtual memory

operation, said real address including first, second and third real address portion, said first virtual address including said first real address portion and a second virtual address portion, said processing means further selectively providing first and second processor signals as a function of a desired one of a plurality of real and virtual memory operations to be performed by the data processing system;

address translation means coupled to said processing means and said memory bus being responsive to said first processor signal and virtual address from the processing means via said memory bus for translating said second virtual address portion into said second and third real address portions during a first cycle, for, generating said second processor signal to a memory state generator and for forwarding said second and third real address portions to said memory bus during at least a second cycle;

decoding means coupled to said memory bus for converting said third real address portion into memory operation signals that determine which one of said plurality of memory operations is to be performed by the data processing system;

said memory state generator selectively responsive to said first and second processor signals and to said memory operation signals for selectively generating an associated predetermined set of state signals that determine the number of cycles required to perform a desired one of said plurality of real and virtual memory operations;

memory timing control means responsive to said set of state signals for selectively generating a set of timing control signals;

memory output control means selectively responsive to addresses said real address portions on said memory bus and to said set of control signals from said memory timing control means for buffering and selectively gating memory control signals and said first and second real address portions to initiate the selected one of said plurality of real and virtual memory operations;

an addressable memory being selectively responsive to said set of memory control signals and said first and second real address portions for accessing desired data during the cycle time of the memory operation that is determined by said set of timing control signals; and

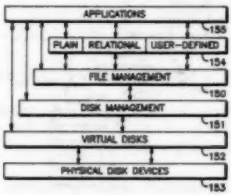
output means coupled to said addressable memory and to said memory bus for passing accessed data therebetween.

4,694,396

METHOD OF INTER-PROCESS COMMUNICATION IN A DISTRIBUTED DATA PROCESSING SYSTEM

Bernhard P. Weisshaar, Toronto; Frank C. Kolnick; Andrew I. Kun, both of Willowdale, all of Canada, and Bruce M. Mansfield, Kent, Wash., assignors to Computer X, Inc., Schaumburg, Ill.

Filed May 6, 1985, Ser. No. 730,892
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—300 **13 Claims**



1. A method of communicating between processes in a distributed data processing system, said system comprising a plurality of individual cells and at least two processes resident on different ones of said cells, said method comprising the steps of:

(a) generating a request by a first process located in a first one of said cells to transmit a message to a second process identified only by name, and

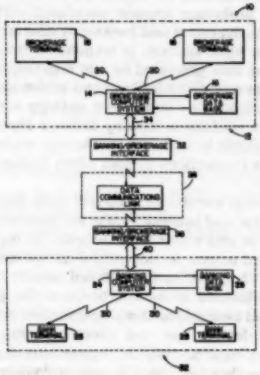
(b) transmitting said message to said second process.

4,694,397

BANKING/BROKERAGE COMPUTER INTERFACE SYSTEM

David J. Grant, Marlborough, and Andrew M. Vignola, Sr., Cheshire, both of Conn., assignors to The Advest Group, Inc., Hartford, Conn.

Filed Dec. 27, 1984, Ser. No. 686,976
Int. Cl.[4] G06F *15/30*
U.S. Cl. 364—408 **3 Claims**



1. Apparatus for interfacing a banking system and a brokerage system to automatically create transaction processing within and between said banking and said brokerage systems, said brokerage system having a number of brokerage offices, said apparatus comprising:

a banking system having a plurality of client bank accounts;

bank account data file means for storing information characterizing each client bank account;

a brokerage system having a plurality of client brokerage accounts, at least one of said brokerage account clients having a bank account in said banking system;

brokerage account data file means for storing information characterizing each client brokerage account;

means for entering data at a brokerage office into said brokerage system for a client having bank and brokerage accounts, said data being representative of a plurality of client desired transaction activities, at least one of said plurality of activities characterized by a first activity wherein a bank account deposit transaction is initiated at said brokerage system, a second of said plurality of activities characterized by a bank account withdrawal transaction initiated at said brokerage system and a third of said plurality of activities characterized by a purchase or sale of investment instruments at said brokerage system;

first means responsive to said entry means activity data and said brokerage data file means for updating said client brokerage account characterizing information and for automatically generating data representative of a monies transfer transaction between said brokerage system and said banking system for said client banking and brokerage accounts;

receiving and verification means at said banking system for receiving and verifying said monies transfer transaction data;

second means responsive to said transfer transaction data and said banking data file means for updating said client bank account characterizing information to reflect said

client desired transaction activity entered at said brokerage system office;

wherein monies deposited at said brokerage system by said client and identified for repository at said banking system in a bank account associated with said client making the deposit at said brokerage system are deposited in said client bank account in response to monies transfer transaction data generated by said brokerage and banking systems for said client banking and brokerage accounts in accordance with an investment strategy associated with said client, said client brokerage account deposited monies being available for withdrawal from said client bank account by said client at said banking system;

wherein monies deposited at said banking system by said client and identified for repository at said brokerage system in a brokerage account associated with said client making the deposit at said banking system are deposited in said client bank account in response to monies transfer transaction data generated by said brokerage and banking systems for said client banking and brokerage accounts in accordance with an investment strategy associated with said client, said client banking account deposited monies being available in said client brokerage account to satisfy brokerage transactions by said client brokerage account, and

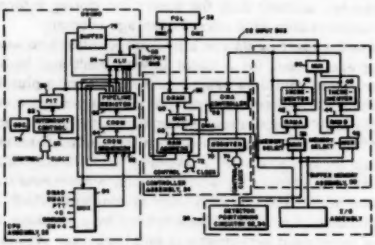
wherein monies withdrawn from said client bank account by said client at said banking system are satisfied from monies reposing in said client bank account to the extent such withdrawal monies do not exceed the monies available in said client bank account, additional monies representative of the difference in monies between the desired withdrawal and available bank account monies being automatically transferred from said client brokerage account to said client bank account in response to monies transfer transaction data generated by said brokerage and banking system for said client banking and brokerage accounts in accordance with an investment strategy associated with said client.

4,694,398

DIGITAL IMAGE FRAME PROCESSOR

Francis R. Croteau, Burlington, Mass., assignor to Baird Corporation, Bedford, Mass.

Filed Sep. 25, 1984, Ser. No. 654,323
Int. Cl.[4] G01T *1/29*; G06F *15/52*
U.S. Cl. 364—414 **11 Claims**



1. A frame processor for images produced by a digital camera system characterized by an array of digital detecting means and an array of digital transducing means, said frame processor comprising:

(a) buffer means including at least a buffer random access memory characterized by firmware arrays of buffer record means for operative connection to said array of digital detecting means and said array of digital transducing means;

(b) controller means including a dynamic random access memory characterized by firmware arrays of dynamic record means operatively connected to said buffer means for association with said firmware arrays of buffer record means;

(c) logic means including an arithmetic logic unit incorporating a bit slice arrangement of microprocessors operatively connected to said controller means for association with said firmware arrays of dynamic record means;

(d) said buffer record means being responsive to signals corresponding to software arrays of data representations and software arrays of correction representations from said digital detecting means and said digital transducing means in order to produce software arrays of initial buffer data;

(e) said dynamic record means being responsive to signals corresponding to said software arrays of initial buffer data to produce software arrays of initial dynamic data;

(f) said arithmetic logic unit being responsive to signals corresponding to said software arrays of initial dynamic data to produce software arrays of functionally transformed data;

(g) said dynamic record means being responsive to signals corresponding to said software arrays of functionally transformed data to produce software arrays of output dynamic data; and

(h) said arithmetic logic unit and said dynamic random access memory of the controller means being responsive to signals corresponding to software arrays of output dynamic data to present software arrays of final image representations;

(i) said buffer means including a first random access memory means and a second random access memory means;

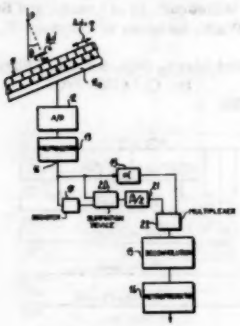
(j) wherein during a single given time interval said first random access memory means and said second random access memory means respond to signals corresponding to first software arrays of data representations and second software arrays of data representations from said digital detecting means and said digital transducing means.

4,694,399

PROCESS OF IMAGE RECONSTRUCTION BY TOMODENSITOMETRY WITH IMPROVED SPATIAL RESOLUTION

Siv C. Tan, Paris; Tri H. Nguyen, Le Pre St. Gervais, and Claude D. Benchimol, Paris, all of France, assignors to Thomson-CGR, Paris, France

Filed Mar. 14, 1985, Ser. No. 711,609
Claims priority, application France, Mar. 16, 1984, 84 04113
Int. Cl.[4] G06F *15/42*
U.S. Cl. 364—414 **2 Claims**



1. A process of tomodensitometric image reconstruction, which comprises rotating a measuring assembly including an X-ray source and detection means in the plane of a section to be imaged, said detection means operating within a certain zone so as to detect the non-absorbed X-rays, taking a prede-

termined number of views which comprise each constant pitch samples of N values representing the linear attenuation values produced by said detection means for a given angular position of said measuring assembly, said views being taken at a constant angular pitch, and subjecting said views to deconvolution and retroprojection, said process further comprising the steps of:

setting off the centre of the detection zone by a quarter of said sampling pitch with respect to the centre of rotation of said measuring assembly;

gathering the views of an image over one complete revolution of said measuring assembly;

weighing said attenuation values for each view, by applying a first selected coefficient;

producing for each view a number of intermediary values, equivalent to the number of attenuation values, each intermediary value being obtained by adding two attenuation values corresponding to measured sampled adjacent values of said detection means and by weighing the thus obtained sum with a second selected coefficient; and

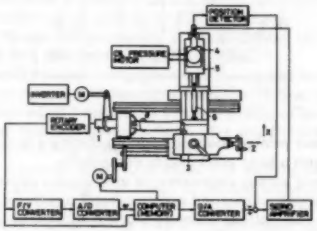
applying said deconvolution and retroprojection to each group of weighed attenuation values and intermediary values corresponding to each view.

4,694,400
Patent Not Issued For This Number

4,694,401
APPARATUS FOR FORMING DIVERSE SHAPES USING A LOOK-UP TABLE AND AN INVERSE TRANSFER FUNCTION

Toshiro Higuchi, Yokohama, Japan, assignor to Research Development Corporation of Japan, Tokyo, Japan

Filed Feb. 13, 1984, Ser. No. 579,825
Claims priority, application Japan, Mar. 31, 1983, 58-53905
Int. Cl.⁴ G06F *15/46*
U.S. Cl. 364—475 **3 Claims**



2. In an apparatus having a rotatable article and a movable part wherein the distance from the center of rotation of said article is controlled to form a pre-designated closed curve on said article, an apparatus for forming diverse shapes, said apparatus comprising:

means for detecting a rotational angle of said rotatable article;

a memory means for storing a function value representative of said pre-designated closed curve shape corresponding to each rotational angle and a pre-calculated derivative value;

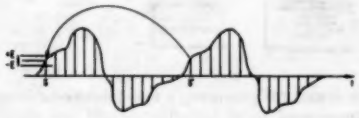
arithmetic operational means responsive to an output representative of a rotational angle from said detecting means for reading a function value and a derivative value from said memory means corresponding thereto, arithmetically generating a modified signal value so as to obtain a transmission characteristic reverse to a transmission function of a servo-mechanism, used in controlling the position of the movable part, from said read-out values, and outputting said modified signal for designating a position of said movable part forming said designated closed curve; and

a control mechanism including said servo-mechanism for controlling the position of said movable part according to the output from said arithmetic operational means.

4,694,402
WAVEFORM DISTURBANCE DETECTION APPARATUS AND METHOD

Alexander McEachern, Oakland, and Frederic Nitz, Boulder Creek, both of Calif., assignors to Basic Measuring Instruments, Foster City, Calif.

Filed May 28, 1985, Ser. No. 738,566
Int. Cl.⁴ G01R *19/65, 29/04*
U.S. Cl. 364—487 **49 Claims**



49. A waveform disturbance detection apparatus for detecting disturbances in an alternating waveform having periodic, normally similar cycles, comprising

means for obtaining consecutive samples from a current cycle of the waveform;

means for storing consecutive reference samples from a reference cycle, wherein the reference cycle is the cycle which immediately preceded the current cycle of the waveform;

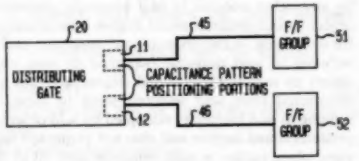
means for comparing each of the consecutive samples from the current cycle, as each consecutive sample is obtained, to a corresponding one of the reference samples stored in the storing means to detect whether a disturbance is present in the waveform; and

means for replacing each of the reference samples stored in the storing means with the corresponding sample from the current cycle against which it was compared, so that the reference samples in the storing means are updated each time a sample from the current cycle is evaluated.

4,694,403
EQUALIZED CAPACITANCE WIRING METHOD FOR LSI CIRCUITS

Minoru Nomura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 27, 1984, Ser. No. 644,512
Claims priority, application Japan, Aug. 25, 1983, 58-155583
Int. Cl.⁴ H01L *27/02, 27/10;* **H03H** *21/00;* **H04B** *3/00*
U.S. Cl. 364—488 **9 Claims**



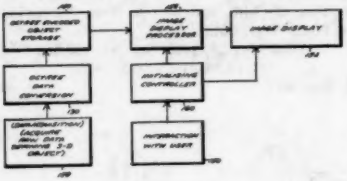
7. A method for compensating a signal transmission delay time in a LSI circuit which includes a plurality of individual circuits and at least one block having input and output terminals and a predefined area in which electric wiring is placed, comprising the step of applying a capacitance pattern having a predetermined capacitance value onto said predetermined area of said block, thereby to insert an equalizing capacitance in said individual circuits to provide said signal transmission delay time compensation.

4,694,404

HIGH-SPEED IMAGE GENERATION OF COMPLEX SOLID OBJECTS USING OCTREE ENCODING

Donald J. R. Meagher, Loudonville, N.Y., assignor to Key Bank N.A., Albany, N.Y.

Filed Jan. 12, 1984, Ser. No. 570,287
Int. Cl.[4] G06F *15/62*; G09G *1/14*
U.S. Cl. 364—518 **110 Claims**



52. A system for generating a two-dimensional image of a three-dimensional scene including at least one object, said system comprising:

data acquisition means for acquiring input data volumetrically defining an object to be displayed;

data conversion means, responsive to said input data acquired by said data acquisition means, for generating electrical signals defining said object within a three-dimensional universe subdivided into a hierarchy of a plurality of levels of subdivided volumes, each of said levels comprising at least one discrete volume, said volumes being characterized by the degree to which they are occupied by said object, any subdivided volume in said universe being a subdivision of a volume in the level above said any volume;

interactive means for selecting a point of view for viewing said object in response to interaction therewith by a user and for producing signals indicating said selected point of view;

image processing means, connected to said data conversion means and said interactive means, for generating electrical signals specifying an image of said object as viewed from said selected view point, including:

(1) image window processing means for establishing a two-dimesional view plane, including means for subdividing said view plane into a plurality of discrete areas;

(2) object node processing means, responsive to said electrical signals produced said conversion means and also connected to receive said selected point of view signals for determining a traversal sequence in response to said selected point of view signals and for visiting the volumes of said three-dimensional universe in said hierarchy in the order of said sequence until a volume occupied by said object to a predetermined degree which is not visually obstructed from said selected point of view by any other volume in said hierarchy occupied said object to said predetermined degree is encountered, and for so visiting, in the order of said sequence, each of the volumes of said universe occupied by said object to object to said predetermined degree and not visually obstructed from said selected point of view by any volume in said hierarchy occupied by said object to said predetermined degree and also not projected onto said view plane earlier in said sequence until all of the volumes in said hierarchy occupied by said object to said predetermined degree and not visually obstructed from said selected point of view by any other volume in said hierarchy occupied by said object to said predetermined degree have been visited;

(3) geometric processing and projecting means, connected to receive said point of view signal and operatively coupled to said object node processing means, for projecting each of said unobstructed volumes onto said view plane at a location and orientation determined by said selected point of view and the location of said volumes in said three-dimensional universe;

(4) geometric comparing means, operatively coupled to said image window processing means and said geometric processing and projecting means, for determining, for each of said projections, which of said discrete view plane areas are enclosed by said projections and which of said view plane areas intersect but are not enclosed by said projections, said view plane subdividing means including recursive means for further subdividing view plane areas determined by said geometric comparing means to intersect but not to be enclosed by said projections; and

(5) window writer means, connected to said geometric comparing means for painting said areas of said view plane determined to be both enclosed by a projection and not already painted because of enclosure by the projection of a volume visited earlier in said sequence; and

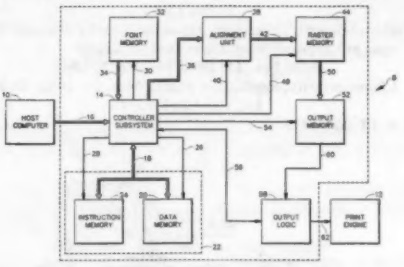
image display means, connected to said window writer means, for displaying the painted view plane areas.

4,694,405

LASER PRINTER CONTROLLER DATA ALIGNMENT DEVICE

Colin Bradbury, and George H. Douglas, both of San Diego, Calif., assignors to Office Automation Systems, Inc., San Diego, Calif.

Filed Jul. 9, 1985, Ser. No. 753,669
Int. Cl.[4] G01D *15/06*
U.S. Cl. 364—518 **16 Claims**



1. A laser printer controller for interfacing a host computer system with a laser print engine comprising:

processor means responsive to user inputs, controller program instructions and system control signals for providing data calculations, memory storage addressing and operational control signals;

control memory means for storing a display list of certain character representations selected from a predetermined set of character representations and their respective locations for a page of data to be printed;

font memory means for storing a dot-by-dot character pattern corresponding to each character representation of said predetermined set of character representations;

output memory and logic means for holding a dot line of data to be printed and for controlling the serial transmission of the data in each dot line to a laser print engine for printing thereby;

raster memory means for receiving and storing a partial page bit map of the page of data to be printed, said partial page bit map providing sequential dot lines of data for transfer to the output memory and logic means, said raster memory means having means for clearing the dot line just transferred to the output memory means and logic means, and scroll means for appending the just cleared dot line to the bottom of the partial page bit map; and

alignment device means responsive to said processor means

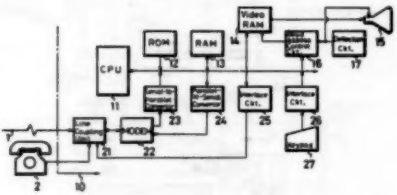
for accepting data words containing the dot-by-dot character patterns in a first word orientation associated with said certain character representations from the control memory means, and for generating and storing data words in a second orientation having bit representations of print data in the partial page bit map for transfer to said raster memory means, said alignment device means including means for aligning the data words of the first word orientation with the data words of a second orientation as required by fixed storage boundaries of the partial page bit map in the raster memory means and means for inclusively ORing the aligned second word orientation in the partial page bit map of the raster memory.

4,694,406

APPARATUS FOR DISPLAYING SCROLLING IMAGES

Michiro Shibui, Tokyo; Yoshihiro Hanamoto, Hyogo; Yoshio Ishigaki, Tokyo; Hiroshi Sahara, Kanagawa; Satoru Maeda, Kanagawa, and Yasushi Noguchi, Kanagawa, all of Japan, assignors to Nippon Telegraph & Telephone and Sony Corporation, both of Tokyo, Japan

Filed Apr. 12, 1985, Ser. No. 722,448
Claims priority, application Japan, Apr. 13, 1984, 59-74367
Int. Cl.[4] G06F *3/14*
U.S. Cl. 364—518 **8 Claims**



1. Apparatus for scrolling display images derived from a data signal formed as a plurality of packets that include pattern signals formed of a plurality of horizontal lines and a corresponding color signal, said apparatus comprising:

display means for producing a visual display of an input signal as a plurality of horizontal lines;

first memory means connected for receiving and storing said pattern signals and having a plurality of first addresses corresponding respectively to said plurality of horiozontal display lines and having a first buffer area for temporarily storing received pattern signals;

second memory means connected for storing said color signal and having a plurality of second addresses corresponding respectively to said plurality of packets and having a second buffer area for temporarily storing received color signals;

means for storing said pattern signals and a corresponding color signal in said first and second buffer areas, respectively;

means for reading out said first memory means and said first buffer area by accessing aid first addresses in a firt predetermined order and for reading out said second memory means including said second buffer area by accessing said second addresses in a second predetermined order;

means for incrementing the number of an initial accessing address of said first memory means every hroizontal period and means for incrementing the number of an initial accessing address of said second memory means every plurality of horizontal periods, whereby said first and second buffer memory areas are read out respectively, after said first and second memory means; and

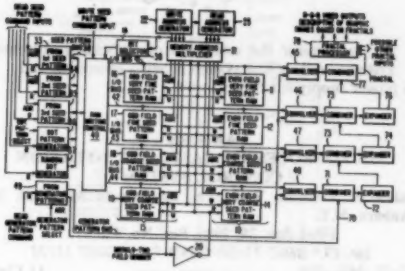
means for transferring a pattern signal of a horizontal line stored in said first buffer area to a corresponding address of said first memory means and for transferring a corresponding color signal stored in said second buffer area to a corresponding address of said second memory means, whereby said pattern signals and said corresponding color signal are fed to said display means.

4,694,407

FRACTAL GENERATION, AS FOR VIDEO GRAPHIC DISPLAYS

Joan M. Ogden, Somerset County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 11, 1985, Ser. No. 743,623
Int. Cl.[4] G06F *15/336, 15/66*
U.S. Cl. 364—518 **55 Claims**



1. A method of generating fractals comprising the steps of:

convolving generator patterns with seed patterns of dots to generate convolution results for each of a plurality of sample spaces, such spaces being consecutively ordinally numbered in order of their successively more sparse sampling;

expanding the convolution results in each of the higher numbered sample spaces through interpolation to a sampling density comparable to that in a lower numbered sample space;

combining samples of the convolution results and the expanded convolution results of similar sampling density on a corresponding sample-by-sample basis; and

carrying out said steps of expanding through interpolation and said steps of combining so as to result in the expanded convolution results of each of the higher numbered sample spaces ultimately being combined with the convolution results in said first sample space, thereby generating said fractals.

4,694,408

APPARATUS FOR TESTING AUTO ELECTRONICS SYSTEMS

James V. Zaleski, 1631 Paterna Rd., Santa Barbara, Calif. 93103

Filed Jan. 15, 1986, Ser. No. 819,252
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—551 **13 Claims**

1. A diagnostic test unit for automobile electronics systems, comprising:

an off-vehicle microprocessor,

means for selecting and providing operational controls to the microprocessor during a test sequence,

a selectable program means providing a selectable one of a plurality of diagnostic test sequences to the microprocessor for exercising and altering the operation of particular electrical systems in the automobile,

a transceiver which is connectable to provide an interface between the microprocessor and the automobile electronics system, the transceiver providing an interactive path for transmitting test signals from the microprocessor to

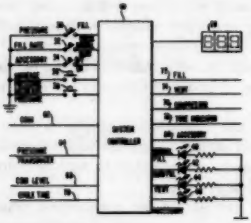
exercise and alter the operation of said systems in the automobile, and a receiver path enabling the microprocessor to monitor the condition of associated automobile systems while a first system is being exercised, and a power supply for the test unit.

4,694,409

MICROPROCESSOR BASED AIR INFLATION CONTROL SYSTEM

Michael E. Lehman, York, Pa., assignor to Monorail, Inc., Auburn, N.Y.

Filed Jun. 25, 1984, Ser. No. 623,871
Int. Cl.[4] B60C *23/00*; G05D *7/00*; G06F *15/21*
U.S. Cl. 364—558 **11 Claims**



2. A system for adjusting the air pressure in automobile tires and other inflatable devices comprising:

a source of pressurized air;

normally closed inflation valve means having an inlet connected to said source of pressurized air and an outlet connectable to an inflatable device for inflation thereof;

normally closed vent valve means having an inlet connectable to the inflatable device and an outlet for venting the inflatable device;

pressure selector means manually operable by a user of said system for selecting a desired air pressure for the inflatable device;

pressure sensing means for sensing the actual air pressure in the inflatable device;

comparison means for determining the pressure difference between the desired air pressure and the actual air pressure;

first valve control means responsive to said comparison means determining that the desired air pressure exceeds the actual air pressure by at least a first predetermined amount for opening said inflation valve means for an inflation time interval having a duration which varies in response to the magnitude by which the desired air pressure exceeds the actual air pressure, to cause air to pass from said source to an inflatable device connected to said inflation valve means and responsive to said comparison means determining that the desired air pressure exceeds the actual air pressure by at least a second predetermined amount, greater than the first predetermined amount, for opening said inflation valve means for a time interval substantially less than that required to increase the measured actual air pressure to the desired air pressure to avoid inadvertent overfilling of the inflatable device in the event initial connection of the inflation valve means to the inflatable device has resulted in an erroneously low reading of actual air pressure;

second valve control means responsive to said comparison means determining that the actual air pressure exceeds the desired air pressure by at least a third predetermined amount for opening said vent valve means for a vent time interval, to vent air from an inflatable device connected to said valve means inlet; and

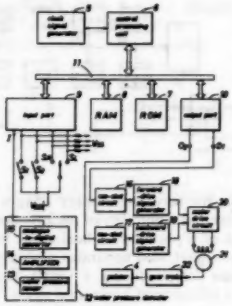
means for operating said sensing means and said comparison means upon closure of said inflation valve means or said vent valve means at the end of an inflation time interval or a vent time interval.

4,694,410

PHYSICAL QUANTITY INDICATING DEVICE BY A POINTER

Mitsuhiro Murata, Sayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jul. 24, 1985, Ser. No. 759,014
Claims priority, application Japan, Jul. 26, 1984, 59-113778; May 24, 1985, 60-111491
Int. Cl.[4] G01L *13/06*; G06F *15/20*
U.S. Cl. 364—558 **4 Claims**



1. A device for indicating a physical quantity comprising:

a pointer for indicating a physical quantity; a reversible type pulse motor for driving said pointer;

a detector for detecting said physical quantity at predetermined sampling intervals;

converting means for converting a sampled value of said physical quantity to an indicating data representing the position of said pointer for indicating said sampled value;

a first memory for storing said indicating data till next sampling time;

judging means for judging in which direction said pulse motor is to be driven to provide a data representing the direction of rotation of said pulse motor by comparing the present indicating data with the previous or last indicating data stored in said first memory;

determining means for determining the amount of rotation of said pulse motor on the basis of the difference between the present indicating data and the previous indicating data to provide a data representing the amount of rotation of said pulse motor;

a second memory for storing a motor driving information based on said data of direction and amount of rotation of said pulse motor;

drive-signal producing means for providing a pulse motor-driving signal to drive said motor by the such number of steps in such direction as based on said motor driving information stored in said second memory; and

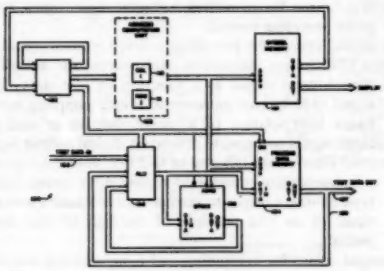
a pulse motor driving circuit for amplifying and directing said pulse motor-driving signal to said pulse motor.

4,694,411

SIMULATION APPARATUS AND METHOD

James L. Burrows, Merrimack, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Feb. 4, 1985, Ser. No. 698,286
Int. Cl.[4] G06F *15/20, 9/44*
U.S. Cl. 364—578 18 Claims



9. Apparatus for simulating a network of processing elements arranged in an array pattern, the processing elements comprising the network being of predetermined types each having selected characteristics and being identified by a unique representation, said apparatus comprising:

a. memory means comprising:

(i) network storage means having a plurality of storage locations arranged in an array pattern corresponding to the array pattern of the network, each storage location storing the representation of the processing element at the corresponding location in the network; and

(ii) data storage means for storing process data representative of processing by the processing elements in the network;

b. address computation means connected to said memory means for computing an address for transmission to said memory to identify a storage location in said memory;

c. processing means connected to said data storage means for receiving process data from said data storage means; and

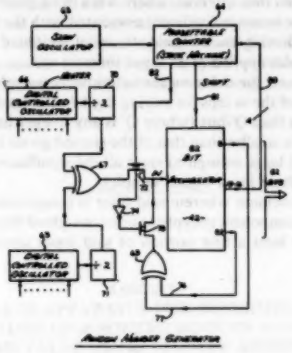
d. control means connected to said address computation means, said processing means and said memory for iteratively generating control signals for (i) enabling the retrieval of the representation of the processing element from the memory at the location identified by said address computation means and generating an address control signal in response to the retrieved representation, said address control signal being coupled to said address computation means to control the generation of an updated address for a succeeding iteration, and (ii) enabling the processing by said processing means of process data from said data storage means and said address computation means including counter means responsive to an address control signal from said control means.

4,694,412

RANDOM NUMBER GENERATOR FOR USE IN AN AUTHENTICATED READ-ONLY MEMORY

Stephen L. Domenik, Santa Cruz; Alan C. Folmsbee; Tai Nguyen, both of Santa Clara, and David A. Shirgley, San Jose, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 421,513, Sep. 22, 1982. This application Sep. 30, 1985, Ser. No. 782,078
Int. Cl.[4] G06F *1/02*
U.S. Cl. 364—717 3 Claims



1. A random number generator for generating a random digital number comprising:

a first, second and third oscillators, said first oscillator oscillating at a relatively lower frequency when compared to said second and third oscillators;

first gating means coupled to receive the output of said second and third oscillators;

a counter coupled to receive an output of said first oscillator, wherein said first oscillator frequency determines a counting rate of said counter;

second gating means operating under control of said counter for gating signals from said first gating means;

an accumulator means for accumulating a digital number coupled to receive signals from said second gating means, said accumulator being coupled to said second and third oscillators for varying the frequency of oscillations of said second and third oscillators;

said accumulator also coupled to said counter, wherein a portion of an output of said accumulator determines a preset value of said counter;

third gating means also operating under control of said counter for gating selected output lines of said accumulator as feedback to input of said accumulator, wherein said accumulator is shifted a predetermined number of times to further accumulate said digital number when said second gating means is inactive;

whereby a random number is generated within said accumulator.

4,694,413

COMPACT-STRUCTURE INPUT-WEIGHTED MULTITAP DIGITAL FILTERS

James H. Arbeiter, Hopewell, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 19, 1984, Ser. No. 632,467
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—724 11 Claims

1. In an m-tap input-weighted digital filter (where m is a first integer of three or more) responsive to an input stream of successive digital samples for deriving a filtered output stream of successive digital samples; wherein;

(a) each of said input and output digital samples is defined by

Q-bits (where Q is a second given integer of three or more);

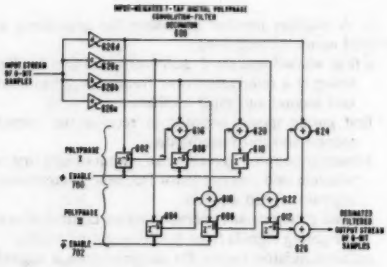
(b) each of said input digital samples is applied to a first of the m taps of said filter, and the relative weight of the first of the m taps of said filter is no greater than one-fourth, thereby deriving a stream of weighted input digital samples for the first of the m taps;

(c) at least each of a subset of the m taps that include the first of the m taps has individually associated therewith a delay means for storing each of S successive digital samples for a given time interval (where S is a third given integer), the delay means individually associated with the first of the m taps having each of said stream of weighted input digital samples applied as an input thereto; and

(d) at least the delay means individually associated with the first of the m taps for storing digital samples defined by no more than Q'-bits (where Q' is any integer having a value that is smaller than that of the second given integer Q and yet is large enough to store all the significant bits of each weighted input digital sample);

the improvement wherein said filter is comprised of:

a first component polyphase input-weighted filter responsive to at least a first portion of said input stream, said first



component filter having respective taps which comprises solely all the odd ones of said m-taps of said filter, the sum of the weights of all said odd ones of said m-taps having a value substantially equal to one-half and an individual one of said S-sample delay means associated with at least each but the last of said odd ones of said m-taps;

a second component polyphase input-weighted filter responsive to at least a second portion of said input stream, said second component filter having respective taps which comprises solely all the even ones of said m-taps of said filter, the sum of the weights of all said even ones of said m-taps having a value substantially equal to one-half an individual one of said S-sample delay means associated with at least each but the last of said even ones of said m-taps, and at least the delay means individually associated with the first of said even ones of said m-taps for storing digital samples defined by no more than Q'-bits; and

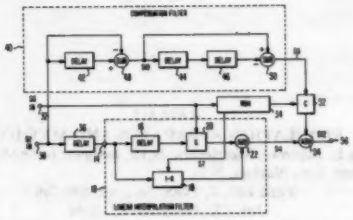
combining means coupled to both the last of said odd ones of said m-taps of said first component polyphase filter and the last of said even ones of said m-taps of said second component polyphase filter for deriving said filtered output stream of successive digital samples of said input-weighted digital filter.

4,694,414

DIGITAL DELAY INTERPOLATION FILTER WITH AMPLITUDE AND PHASE COMPENSATION

Todd J. Christopher, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 19, 1984, Ser. No. 683,678
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—724 **8 Claims**



1. Delay apparatus, comprising;

a first source for providing a digital input signal having a given sampling period;

a second source for providing a delay control signal;

first filter means coupled to said sources for delaying said digital input signal as a function of said delay control signal in fractional increments of said sampling period by linear interpolation of adjacent samples of said digital input signal to provide a delayed digital output signal;

second filter means coupled to said first source for providing a compensating signal, said second filter means being of a type having a response zero at zero frequency and a delay equal to an odd multiple of one-half of said sampling period;

output means for combining said compensating and delayed signals to provide a resultant digital output signal; and

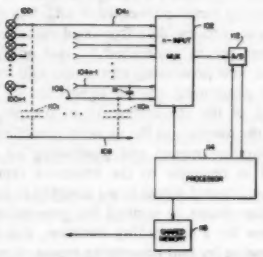
amplitude control means connected in cascade with said second filter means for controlling the amplitude of said compensating signal as a predetermined function of said delay control signal for minimizing variations in both the amplitude and the delay with frequency of said resultant signal.

4,694,415

ADAPTIVE DIGITAL FILTER FOR ANALOG INPUT SIGNALS

Joel E. Hasenkopf, Allison Park, and James F. Sutherland, Plum Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 1, 1985, Ser. No. 729,397
Int. Cl.[4] G06F *15/31*
U.S. Cl. 364—724 **13 Claims**



1. A filter for an input signal subjected to noise having a frequency, said filter comprising:

reference input means for supplying a reference signal indicating the frequency of the noise;

sampling means for receiving and sampling the input and reference signals at a sampling rate and for generating input and reference samples; and

processor means for producing sums of the input and reference samples, respectively, generated during at least one cycle of the noise and for adjusting the sampling rate of said sampling means when the sum of the reference samples is not equal to zero.

4,694,416

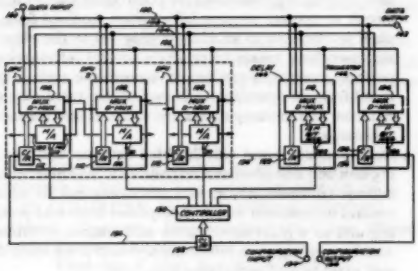
VLSI PROGRAMMABLE DIGITAL SIGNAL PROCESSOR

James E. Wheeler, Schenectady; Robert M. Hardy, Scotia; Robert J. Dunki-Jacobs, Saratoga, and William J. Premerlani, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 25, 1985, Ser. No. 705,290

Int. Cl.[4] G06F *7/38, 15/00*

U.S. Cl. 364—736 **7 Claims**



1. A circuit for performing different signal processing functions on digital input data, said data being in the form of binary data words, each word being presented in a bit by bit serial manner to said circuit, each of said different functions being provided by uniquely combining a series of substantially identical algebraic subfunctions performed concurrently on said input data and partially processed input data comprising:

a plurality of substantially identical algebraic digital operating units for receiving and operating on said input data to generate output data or partially processed input data, each said digital operating unit being adapted to perform said identical subfunction, and

signal directing means coupled intermediate said units for moving said input data and partially processed data into and through said units concurrently in a plurality of unique patterns, each unique pattern being associated with one of said different signal processing functions, said signal directing means being responsive to preselected user input to direct data through said plurality of units in one of said unique patterns such that said input data is operated on to generate the associated one of said plurality of functions;

said signal directing means including a plurality of data paths, configuration register means for receiving user provided configuration control signals, and multiplexer means responsive to said configuration register means for selectively coupling said data paths to said operating units to thereby direct data through said operating units in one of said patterns as determined by said user provided configuration control signals;

said multiplexer means including a plurality of multiplexer units, one of said units being associated with each of said operating units, said multiplexer units coupled to each of said data paths, each said multiplexer unit being operated to couple its associated operating unit with each of said remaining multiplexer untis via said data paths in response to said configuration control signals;

said operating units further including means for multiplying a first data word by a second data word to provide an intermediate output; and

means for adding said intermediate output to a third data word to provide a first operating unit output coupled to an associated multiplexer unit, each said operating unit further including first and second registers, said registers each having an input and an output, said inputs coupled to receive and temporarily store said first and second data words, said outputs coupled to said associated multiplexer unit to enable a delayed replica of said first and second data words to be selectively coupled to others of said operating units in accordance with said configuration control signals.

4,694,417

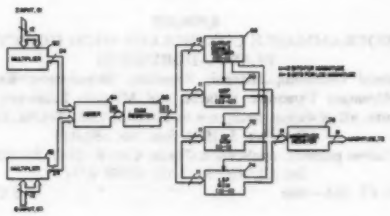
METHOD AND APPARATUS FOR DETERMINING THE MAGNITUDE OF A SQUARE ROOT OF A SUM OF SQUARED VALUE USING VERNIER ADDRESSING

Robert H. Cantwell, Sudbury, Mass., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 400,330, Jul. 21, 1982, Pat. No. 4,636,973. This application May 21, 1986, Ser. No. 865,322

Int. Cl.[4] G06F *7/38*

U.S. Cl. 364—752 **32 Claims**



1. In combination:

first multiplier means for obtaining the square of a first input data word;

second multiplier means for obtaining the square of a second input data word;

means for adding together the outputs from said first multiplier and said second multiplier;

register means for storing the output from said adder means, said output comprising a plurality of vernier address scales for reducing memory storage requirements;

ROM means coupled to said register means and responsive to said vernier address scales for storing numerical values with increased accuracy, the quantization of said numerical values being determined by the bit length of a digital word stored in said ROM means, said ROM means having a first portion coupled to a first portion of said plurality of vernier address scales, a second portion coupled to a second portion of said plurality of vernier address scales and a third portion coupled to a third portion of said vernier address scales; and

ROM decoding means for selecting an output from a portion of said ROM means said portion being addressed by one of said vernier address scales.

4,694,418

FUZZY LOGIC BASIC CIRCUIT AND FUZZY LOGIC INTEGRATED CIRCUIT OPERABLE IN CURRENT MODE

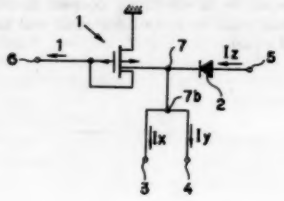
Fumio Ueno; Takeshi Yamakawa, both of Nishigoshi, and Yuji Shirai, Yatsushiro, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Mar. 22, 1985, Ser. No. 714,809

Claims priority, application Japan, Mar. 23, 1984, 59-57121; Mar. 23, 1984, 59-57122; Mar. 23, 1984, 59-57123; Mar. 23, 1984, 59-57124; Mar. 23, 1984, 59-57125

Int. Cl.[4] G06G 7/00, 7/12

U.S. Cl. 364—807 **6 Claims**



1. A fuzzy logic circuit comprising:

a current mirror comprising an FET,

a first input current source connected to the input side of the current mirror,

a second input current source,

a wired OR connected at its input side to the output side of the current mirror and to the second input current source, and

an output terminal connected to the output side of the wired OR.

4,694,419

PROGRAMMABLE CONTROLLER WITH DIRECT TO PLANT ADDRESSING

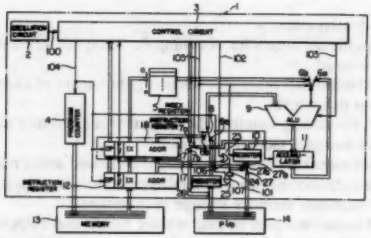
Tadashi Okamoto, Hitachi; Kazuhiko Shimoyama, Katsuta; Hiromasa Yamaoka, Hitachi, and Mitsuro Takakura, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 5, 1984, Ser. No. 658,025

Claims priority, application Japan, Oct. 6, 1983, 58-185832

Int. Cl.[4] G05B 11/01; G06F 9/34

U.S. Cl. 364—900 **5 Claims**



1. A programmable controller for controlling the operations of a plant on the basis of a stored program, comprising:

memory means for storing therein a program, said program containing an instruction taking a register-modified addressing mode as an addressing mode of an operand and an instruction taking a direct addressing mode as the addressing mode of an operand, each of said instructions being read out from said memory means in response to receipt of a corresponding memory address;

a processing unit provided with operating means for supplying an address to said memory means to read out an instruction from said memory means and for performing an arithmetic operation in accordance with said read-out instruction to control a process, including an instruction register for storing an instruction read out from said memory means, means for determining by the contents of the instruction stored in said instruction register whether said instruction is an instruction taking the register-modified addressing mode or an instruction taking the direct addressing mode, a plurality of index registers, an arithmetic circuit, switching means for delivering an address as address information for controlling a plant in such a manner that, when the instruction stored in said instruction register is of the register-modified addressing mode, the contents of an index register specified by an index part of said instruction are added to an address indicated by the address part of said instruction by said arithmetic circuit and the result of addition is delivered as address information for controlling a plant, and when said instruction is of the direct addressing mode, an address indicated by an address part of said instruction is directly delivered as address information to said plant, and control circuit means for controlling said switching means in accordance with said determining means and for controlling said arithmetic circuit to operate on state information received from the plant in response to an address supplied to the plant via said switching means to produce control information to perform control operations in accordance with a command from an operation code part of the instruction read out from said memory means and stored in said instruction register; and

a process input/output unit disposed between said processing unit and said plant and responsive to said plant control address information from said processing unit for sending control information which is outputted from said processing unit to a plant specified by said address information and for sending state information which is inputted from said plant to said processing unit.

4,694,420

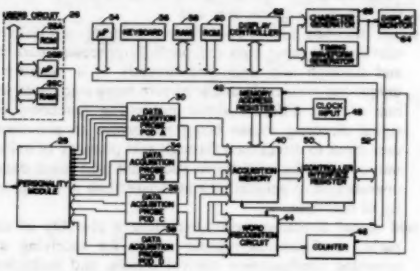
INVERSE ASSEMBLY METHOD AND APPARATUS

Mark E. Pettet, Hillsboro, and Gerd H. Hoeren, Lake Oswego, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 417,014, Sep. 13, 1982, abandoned. This application Dec. 23, 1985, Ser. No. 814,152

Int. Cl.[4] G06F 15/00

U.S. Cl. 364—900 **3 Claims**



1. An inverse assembler capable of converting the code associated with a stored program stored in a memory of a user's circuit, the code being generated from a microprocessor disposed in the user's circuit and having instructions and data information, into a corresponding set of mnemonics for interpretation by a user comprising:

means for entering conversion information into said inverse assembler, said conversion information being a list of code corresponding to said code associated with said stored

program and a list of said mnemonics corresponding thereto;

means for receiving said conversion information and for storing said conversion information, said conversion information being stored in said receiving and storing means in the form of a set of decision tree tables, each decision tree table including entries for portions of code and mnemonic information corresponding thereto and being in a format corresponding to the format associated with a set of user documentation describing the characteristics of said microprocessor;

means responsive to said code associated with the stored program for distinguishing between said instructions and said data information and for assigning a first identifier to said instructions and a second identifier to said data information;

means for acquiring and storing said code associated with said stored program and said first and second identifiers associated therewith, said receiving and storing means correlating said code stored in said acquiring and storing means with a corresponding set of said conversion information stored in said receiving and storing means by providing a combination of mnemonic information from said tables in response to portions of code as stored in said acquiring and storing means; and

means for acquiring said corresponding set of said conversion information from the receiving and storing means and for presenting said corresponding set of said conversion information to said user for interpretation thereof.

4,694,421

INTERFACE SYSTEM WHICH SELECTIVELY PROVIDES IMPEDANCE MATCHING BETWEEN A HOST COMPUTER AND A CONTROL CIRCUIT

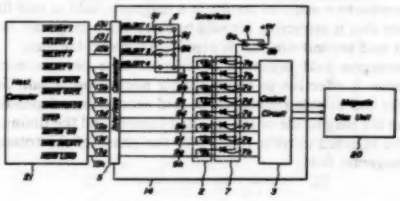
Tetsu Ogawa, Hanazono, Japan, assignor to Canon Denshi Kabushiki Kaishsa, Chichibu, Japan

Filed Jun. 5, 1984, Ser. No. 617,823

Claims priority, application Japan, Jun. 29, 1983, 58-101250

Int. Cl.[4] G06F *13/00*

U.S. Cl. 364—900 **4 Claims**



1. An interface system for connecting a control circuit to a host computer wherein said control circuit is provided with input terminals and said host computer is provided with output terminals, said interface system comprising

a plurality of signal lines, each of said signal lines connecting one of the input terminals of said control circuit to a corresponding one of the output terminals of said computer;

a plurality of resistor elements each having first and second ends, the first end of each of said resistor elements being connected to a corresponding one of said plurality of signal lines;

a connector having first and second terminals, said first terminal being connected to a power source;

a plurality of diode elements each having first and second ends, the first end of each of said diode elements being connected to the second end of a corresponding one of said plurality of resistor elements and the second ends of said diode elements being connected to each other and to the second terminal of said connector, the polarity of each of said diode elements being such that a signal on the signal line to which it is connected through an associated resistor element is not transmitted to said second terminal; and

means for selectively connecting together said first and second terminals whereby, when said first and second terminals are connected together said plurality of resistor elements are connected to said power source to provide impedance matching for the output of said host computer, and when said first and second terminals are not connected said resistor elements are electrically disconnected from the system.

4,694,422

PROTOCOL VALIDATION SYSTEM

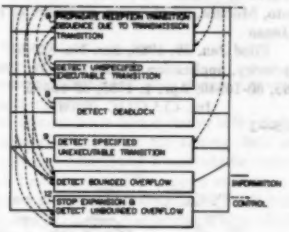
Yoshiaki Kakuda, Tokyo; Yasushi Wakahara, Kanagawa, and Masamitsu Norigoe, Saitama, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

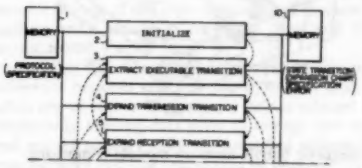
Filed Jun. 24, 1985, Ser. No. 749,591

Claims priority, application Japan, Dec. 25, 1984, 59-271938; Feb. 20, 1985, 60-30208

Int. Cl.[4] G06F *1/00*

U.S. Cl. 364—900 **4 Claims**





1. A protocol validation system which receives a protocol specification having a plurality of processes, in a form of an electrical signal, and tests said protocol specification by expanding a state transition in each process in accordance with transition information of said protocol specification to find errors of said protocol specification, and delivers indication of said errors in the form of an electrical signal, said protocol validation system comprising:

(a) first memory means (1) for storing a protocol which is subject to validation, including an initial state;

(b) first operating means (3, 4, 5, 6) connected to said first memory means for receiving information stored therein and expanding a transmission transition and a corresponding reception transition for each said process, and for monitoring a system state composed of a state in each process and a signal state on a channel between processes;

(c) second memory means (10) connected to said first operating means for storing a state transmission expansion chart for each said process and L value of expanded states for each process;

(d) second operating means (7, 8) connected to said first and second memory means and controlled by said first operating means for detecting an unspecified executable transi-

tion and a deadlock state, in accordance with a predetermined condition, during expansion of a transition;

(e) third operating means (11) connected to said first and second memory means and controlled by said first operating means for detecting a bounded overflow, which is a system state such that the number of signals on a channel between processes exceeds a given channel capacity;

(f) fourth operating means (9) connected to said first and second memory means and controlled by said first operating means for detecting a specified unexecutable transition after completion of expansion; and

(g) fifth operating means (12) connected to said second memory means and controlled by said first operating means for providing an electrical signal to said first operating means to stop said expansion in accordance with detection of a predetermined condition.

4,694,423

MAGNETIC BUBBLE MEMORY MODULE

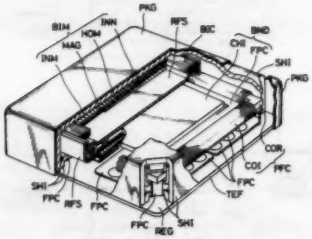
Yutaka Akiba, Fujisawa; Kazuo Hirota, Chigasaki; Nobuo Kishiro, Mobara; Toshio Futami, Mobara, and Tatsuo Hamamoto, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 29, 1986, Ser. No. 823,647

Claims priority, application Japan, Jan. 31, 1985, 60-15341; Feb. 1, 1985, 60-16540; Apr. 1, 1985, 60-66456

Int. Cl.[4] G11C *19/08*

U.S. Cl. 365—2 **9 Claims**



1. A magnetic bubble memory module comprising:

a rectangular core shaped like a picture frame providing windings on respective two pairs of opposite sides;

at least one magnetic bubble memory chip disposed in the area surrounded by said core;

a flexible substrate having chip-loading section means disposed for loading said at least one magnetic bubble memory chip thereon, said chip-loading section means having four corners and including means for providing electrical connections for said at least one chip, said flexible substrate including lead wire section means extending from the four corners of said chip-loading section means and arranged for bending, and connecting section means for providing connections with said lead wire section means and for disposing external connection terminals on an outside surface of said module, said means for providing electrical connections of said chip-loading section means of said flexible substrate consisting of a three-layered structure of a first insulating layer, an intermediate wiring layer, and a second insulating layer;

a revolving magnetic field-confining case for accommodating said core, said at least one chip and said flexible substrate, said revolving magnetic field-confining case including means for enabling drawing out of said lead wire section means of said flexible substrate at the corners of said chip-loading section means.

4,694,424

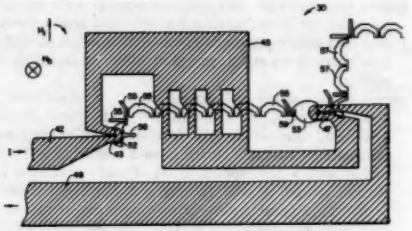
COMBINED NUCLEATE-REPLICATE SINGLE WALL DOMAIN GENERATE STRUCTURE

Guido Galli, Saratoga; Alexander A. Grillo, Cupertino, and Barry R. Lieberman, Los Altos, all of Calif., assignors to Magnesys, San Jose, Calif.

Filed Oct. 1, 1985, Ser. No. 782,743

Int. Cl.[4] G11C *19/08*

U.S. Cl. 365—12 **13 Claims**



1. A magnetic bubble memory comprising:

a thin film of magnetic material capable of supporting single wall magnetic domains, called bubbles, under the influence of a magnetic bias field perpendicular to said thin film, which bubbles may be used to represent bits of digital information;

a patterned layer of high permeability material extending generally parallel to the path of said thin film for providing a propagation path for said bubbles to move under the influence of a rotating magnetic field in the plane of said thin film; and

a patterned layer of electrically conductive material formed to define a conduction path generally parallel to the plane of said thin film and including a first U-shaped portion disposed at a first site and a second U-shaped portion disposed at a second site such that an injection of current in a predetermined sense into said layer of electrically conductive material results in a magnetic field at said first site that is attractive for said bubbles and a magnetic field at said second site that is repulsive for said bubbles;

whereupon said injection of current in a predetermined sense is effective to cause bubble nucleation at said first site and bubble replication at said second site, depending on the magnitude of the injected current and the timing of the injected current relative to the phase of the rotating magnetic field.

4,694,425

SEVEN TRANSISTOR CONTENT ADDRESSABLE MEMORY (CAM) CELL

Michael T. Imel, Beaverton, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jul. 10, 1986, Ser. No. 884,025

Int. Cl.[4] G11C *15/04*

U.S. Cl. 365—49 **8 Claims**

1. A content addressable memory including a pair of column lines (54, 56) upon which information to be matched with the contents of said memory is placed, said memory being driven by a clock such that during particular clock phase a ROW line (50) and a MATCH line (52) are precharged and both column lines are discharged, a memory cell characterized by:

a supply voltage (Vcc);

a first transistor (M1);

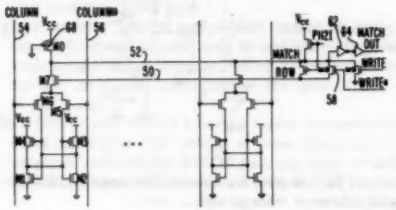
a second transistor (M2);

a third transistor (M3);

a fourth transistor (M4);

said first, second, third and fourth transistors being connected to each other and to said supply voltage (Vcc) to thereby form a cross-coupled inverter storage device;

a fifth transistor (M5);
a sixth transistor (M6); and,
a seventh transistor (M7) that acts as a "reversible diode";
said fifth and a sixth transistors being connected to said "diode" transistor (M7) and between said cross-coupled inverter (M1, M2, M3, M4) and said column lines (54, 56) to thereby form an XOR gate on said column lines (54, 56) and said "diode" transistor (M7);



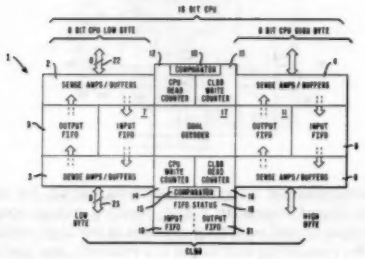
said diode transistor being connected between said fifth and sixth transistors, said ROW line (50) and said MATCH line (52), such that during CAM matches said diode transistor allows charge to be siphoned from said MATCH line (62) and during a write to said CAM cell allows charge to build up.

4,694,426

ASYNCHRONOUS FIFO STATUS CIRCUIT

Kent L. Mason, Beaverton, Oreg., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 20, 1985, Ser. No. 811,851
Int. Cl.[4] G11C *19/00*
U.S. Cl. 365—78 **15 Claims**



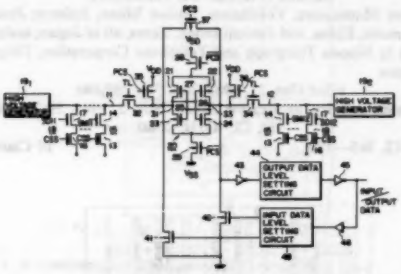
1. A status circuit for determining which of two asynchronously operable counters were last incremented following the detection of correspondence in the count status, comprising;
means for generating a set signal upon the conclusion of an incrementing signal to the first counter;
means for generating a reset signal upon the conclusion of an incrementing signal to the second counter;
means for detecting a correspondence of the numerical counts in the first and second counters and generating a correspondence signal thereupon;
a bistable multivibrator switching to a first state to provide a first signal following the receipt of the set signal, and switching to a second state to provide a second signal following the receipt of the reset signal; and
signal masking means for receiving the correspondence signal and for multiplexing the first and second state signals responsive thereto to identify the last incremented counter.

4,694,427

PROGRAMMABLE SEMICONDUCTOR MEMORY DEVICE WITH COMBINED SENSE AMPLIFICATION AND PROGRAMMING CAPABILITY

Junichi Miyamoto, and Jun-ichi Tsujimoto, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 26, 1985, Ser. No. 759,433
Claims priority, application Japan, Sep. 21, 1984, 59-197925
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—185 **6 Claims**



1. A programmable semiconductor memory device for storing input data comprising:
a first bit line connected to first memory cells, each comprising a nonvolatile transistor for storing data, and a first dummy cell also comprising a nonvolatile transistor;
a second bit line connected to second memory cells, each comprising a nonvolatile transistor for storing data, and a second dummy cell also comprising a nonvolatile transistor;
high voltage generation means, connected to said first and second bit lines, for providing high voltage programming data for storage of said input data into said first and second memory cells and for erasing data from said first and second memory cells;
data detecting and storing means for amplifying a potential difference between said first and second bit lines caused when one of said or first memory cells is selected and for temporarily holding data prior to storage into said first and second memory cells, the amplified potential difference between said first and second bit lines reflecting data stored in said selected one of said first or second memory cells, and said data detecting and storing means including a flip-flop having two input/output nodes;
first switching means, connected between said first bit line and said first input/output node of said data detecting and storing means flip-flop for connecting said flip-flop to said first bit line in response to an enable signal;
second switching means, connected between said second bit line and said second input/output node of said data detecting and storing means flip-flop, for connecting said flip-flop to said second bit line in response to said enable signal;
signal compensation means for selectively inverting the level of said amplified potential difference according to whether said selected memory cell is connected to said first bit line or said second bit line; and
data storage controlling means for controlling the storage of said input data into said first and second memory cells, said data storage controlling means comprising
a first switching transistor having a gate receiving a first storage signal and having a current path connected between a predetermined potential and said first input-/output node of said data detecting and storage means flip-flop,
a second switching transistor having a gate receiving a

second storage signal and having a current path connected between said predetermined potential and said input/output node of said data detecting and storing means flip-flop, and

input data decoding means, coupled to the gates of said first and second transistors, for decoding said input data into said first storage signal having the same level as said input data and said second storage signal having a complementary level to said first storage signal.

4,694,428

SEMICONDUCTOR MEMORY

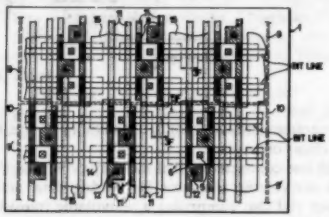
Tsuneo Matsumura, Yokohama; Tsuneo Mano, Isehara; Junzo Yamada, Ebina, and Junichi Inoue, Zama, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Oct. 21, 1985, Ser. No. 789,846

Claims priority, application Japan, Nov. 2, 1984, 59-232083

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—189 **10 Claims**



1. A semiconductor memory, comprising:

main word lines and sub word lines;

bit lines intersecting the sub word lines;

a memory cell array divided into a plurality of unit cell arrays and divided into a plurality of sub arrays in a direction perpendicular to said word lines, each unit cell array comprising two different sub arrays, said memory cell array including memory cells disposed at all intersections of the sub word lines and the bit lines and having cell transistors, the sub word lines connected to the cell transistors in a first one of the sub arrays forming one of the unit cell arrays being connected to a first one of the main word lines, the sub word lines connected to cell transistors in a second one of the sub arrays forming the one of the unit cells being connected to a second one of the main word lines, the first main word line passing through the second sub array and the second main word line passing through the first sub array.

4,694,429

SEMICONDUCTOR MEMORY DEVICE

Sumio Tanaka, Tokyo; Shinji Saito, Yokohama; Shigeru Atsumi, Tokyo, and Nobuaki Ohtsuka, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 27, 1985, Ser. No. 802,376

Claims priority, application Japan, Nov. 29, 1984, 59-252313; Oct. 8, 1985, 60-224060

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—189 **12 Claims**

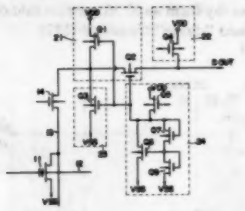
1. A semiconductor memory device comprising:

a bit line;

a memory cell connected to said bit line;

clamp circuit means connected between a power source voltage and said bit line, for clamping said power source voltage and for applying the clamped voltage to said bit line, said clamp circuit means comprising a load MOS transistor whose output current path is connected between said power source voltage and said bit line;

bypass circuit means connected between said bit line and a reference voltage, for bypassing from said bit line to said reference voltage an electric current the amount of which is substantially equal to that of a weak inversion current of said load transistor flowing into said bit line, said bypass circuit means comprising a bypass MOS transistor whose



output current path is connected between said bit line and said reference voltage; and

bias circuit means connected to said load MOS transistor and said bypass MOS transistor, for biasing said load and bypass MOS tansistors.

4,694,430

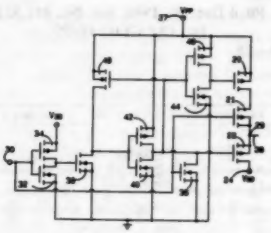
LOGIC CONTROLLED SWITCH TO ALTERNATE VOLTAGE SOURCES

Brian K. Rosier, Jenkintown, Pa., assignor to Sprague Electric Company, North Adams, Mass.

Filed Mar. 21, 1985, Ser. No. 714,288

Int. Cl.[4] G11C *11/40*

U.S. Cl. 365—189 **7 Claims**



5. A semiconductor integrated switching circuit, for connecting an output thereof to a high positive voltage source when the input of said switching circuit is at one logic voltage level and for connecting said output to a relatively low positive voltage source when the input of said circuit is at another logic level, comprising a plurality of P-channel enhancement MOS transistors (P-FET's), a plurality of N-channel enhancement MOS transistors (N-FET's), an input conductor, an output conductor, a high-voltage-source node, a low-voltage-source node and a ground node all being interconnected as follows:

(a) a first of said P-FET's being connected between said output conductor and said low-voltage-source node;

(b) a second and third of said P-FET's forming one series circuit branch that is connected from said output conductor to said high-voltage-source terminal, in that order;

(c) all of said P-FET's having N-type channel body regions, said N-type regions being ohmically connected to said high-voltage-source terminal except that the N-type channel body regions of said first and second P-FET's are connected to said output conductor; all of said N-FET's having P-type channel body regions and sources being connected to said ground node;

(d) the gate of said second P-FET being connected to said input conductor;

(e) one and another CMOS pairs of said transistors each being connected between said ground node and said high-voltage-source node, the output of said one-CMOS-pair being connected to the gate of said third P-FET, and the another-CMOS-pair output being connected to the gate of said first P-FET and to the input of said one CMOS pair;

(f) a third of said N-FET's connected in series with a sixth of said P-FET's between said ground and high-voltage-source nodes, the drains of said third N-FET and sixth P-FET being connected to each other and the input of said another CMOS pair;

(g) yet another CMOS pair of said transistors being connected from said ground node to said low-voltage-source node and having an input connected to said input conductor and an output connected to the gate of said third N-FET; and

(h) a fifth of said N-FET's having a gate connected to said input conductor and having a drain connected to the output of said another CMOS pair, the input of said one CMOS pair and the gate of said sixth P-FET.

4,694,431

SEMICONDUCTOR MEMORY DEVICE WITH INCREASED ADAPTABILITY

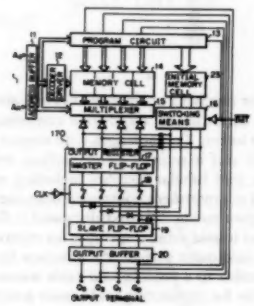
Tamio Miyamura, and Takashi Ohkawa, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Sep. 23, 1985, Ser. No. 779,013

Claims priority, application Japan, Sep. 25, 1984, 59-198607

Int. Cl.⁴ G11C *7/00*

U.S. Cl. 365—189 **6 Claims**



1. A semiconductor memory device comprising:

a memory cell array having a plurality of memory cells;

multiplexer means for selecting the outputs of said memory cell array;

an output register means for receiving said outputs selected by said multiplexer and storing the received data;

an initial data memory cell enabling write-in of data;

an initialization input terminal for providing a control signal to set the data written into said initial data memory cell to said output register means; and

an initial data switching circuit means for supplying to said output register means an output signal having a predetermined potential in accordance with the data written in said initial data memory cell, when said control signal is supplied to said initialization input terminal;

said predetermined potential of said output signal of said initial data switching circuit means being different from the potential of the output signal supplied through said multiplexer means from said memory cell array; and

said output register being adapted to be set by the output signal of said initial data switching circuit means, regardless of the output signal from said memory cell array, when said control signal is supplied to said initialization input terminal.

4,694,432

SEMICONDUCTOR MEMORY DEVICE

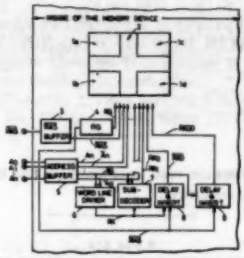
Hideshi Miyatake; Kazuyasu Fujishima, and Kazuhiro Shimotori, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 6, 1985, Ser. No. 709,409

Claims priority, application Japan, Mar. 16, 1984, 59-51861

Int. Cl.⁴ G11C *13/00*

U.S. Cl. 365—203 **6 Claims**



1. A semiconductor memory cell comprising:

a plurality of memory cells for storing binary signals,

a plurality of decoders connected to said memory cells for selecting said connected memory cells, said decoders including normal decoders and a spare decoder,

precharge signal providing means connected respectively to said plurality of decoders for providing a precharge signal to each of said decoders, whereby said decoders are brought into a selective state,

address signal providing means connected respectively to said decoders by a plurality of address signal lines for providing address signals for selecting specifically said decoders,

link elements inserted between said respective decoders and said respective precharge signal providing means and interposed in said plurality of address signal lines for connecting said spare decoders and said address signal providing means, said link elements being caused to be melted so that an electrically insulated state is established to bring an associated circuit line into an electrically disconnected state.

4,694,433

SEMICONDUCTOR MEMORY HAVING SUBARRAYS AND PARTIAL WORD LINES

Siegfried K. Wiedmann, Stuttgart, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 4, 1985, Ser. No. 719,945

Claims priority, application European Pat. Off., May 14, 1984, 84105426.5

Int. Cl.⁴ G11C *8/00*

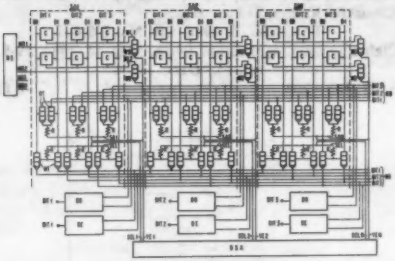
U.S. Cl. 365—230 **5 Claims**

1. A semiconductor array memory comprising a plurality of selectable subarrays arranged on a chip having a common decoder, common read lines and common write lines, data input and output circuits and word lines,

said word lines being divided into several partial word lines, each partial word line line being connected to a word switch,

all word switches of a word line being selected and controlled via at least one word control line, each subarray comprising a matrix of memory cells arranged in word line rows and bit line columns, characterized in that said bit line columns of the same bit value of all subarrays in the semiconductor memory are coupled via read transistors to said common read lines and via write transistors to said common write lines, said common read lines and

common write lines also being directly connected to said data input and output circuits, said read transistors isolating said common read lines from said bit line columns of unselected subarrays.



4,694,434

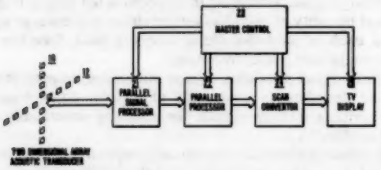
THREE-DIMENSIONAL IMAGING SYSTEM

Olaf T. von Ramm, 3433 Dover Rd., Durham, N.C. 27707, and Stephen W. Smith, 742 Owens St., Rockville, Md. 20850

Filed Jun. 12, 1984, Ser. No. 619,899

Int. Cl.[4] G01N *29/04*; A61B *10/00*

U.S. Cl. 367—7 **10 Claims**



1. A radiated energy pulse-echo imaging system with transducers for transmitting pulse for producing an image of a three-dimensional object in a display having at least two dimensions maintaining perspective, in which, at all ranges, the angular relationships of all targets on the object relative to the origin of the transducers are reproduced in the display, comprising:

an array of transducers for transmitting pulses toward the three-dimensional object and receiving corresponding echo data,

means for steering said array in elevation and azimuthal directions to assume predetermined transmit and receive orientations relative to an initial array position, said array assuming a predetermined angular transmit orientation for each transmitted pulse and a plurality of predetermined angular receive orientations for each transmitted pulse, said array receive orientations being defined by angles formed in the elevation and azimuthal directions between said array in said initial position and said array in said receive orientations, processing means for receiving the echo data for each transmitted pulse from said array of transducers and for producing therefrom output signals indicating a plurality of image points having predetermined locations in the image to be displayed corresponding to the relative locations of those image points on the three-dimensional object,

means for storing values of said echo data to produce a brightness control signal for each said image point,

display means,

and means for communicating said image point output signals and said brightness control signals to said display means and for locating said image point in said display means at a location directly related to said angles defining said array receive orientations,

amplitude weighting means for varying the amplitudes of said image point output signals in relation to the distance from which said echo data are received, said weighted image point output signals being applied to z-axis drive means of said display means.

4,694,435

VERTICAL MARINE STREAMER

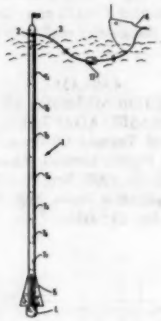
Pierre Magneville, Vernouillet, France, assignor to Institut Francais Du Petrole, Rueil-Malmaison, France

Filed Dec. 30, 1985, Ser. No. 814,766

Claims priority, application France, Dec. 28, 1984, 84 20060

Int. Cl.[4] G01V *1/38*

U.S. Cl. 367—17 **2 Claims**



1. A device for receiving acoustic waves in water at a plurality of different depth levels, the device comprising a hollow tubular member having a great length with respect to an amplitude of a swell and a smooth outer surface transparent to acoustic waves, said tubular member including near one end thereof a closed compartment containing buoyancy means and a plurality of sensor means disposed along and in fixed relationship with respect to said tubular member for receiving acoustic waves through said outer surface, cable means for connecting said tubular member to a vehicle, said cable means comprising transmission lines for connecting said sensor means to recording means on the vehicle, a weight means and profiled stabilizer fins fixed close to an opposite end of said tubular member, a distribution of masses of the hollow tubular member, the buoyancy elements and an arrangement and area of said stabilizer fins is such that the tubular member floats vertically in water in a static stable position and lies in a substantially horizontal position when towed by a vehicle under an effect of hydrodynamic forces on said stabilizer fins, and wherein means are provided for measuring an immersion depth of the cable and connected therethrough to a piloting means whereby said vehicle is prevented from applying any towing force when said tubular member is vertically oriented in water.

4,694,436

NOISE-ATTENUATING STREAMER-CABLE BULKHEAD

Valery A. Gelfand, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed May 29, 1984, Ser. No. 615,086

Int. Cl.[4] G01V *1/38*

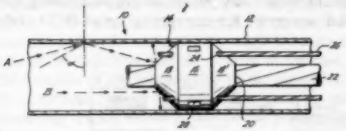
U.S. Cl. 367—20 **7 Claims**

1. A noise-scattering structure for use with a streamer-cable section, said section including a flexible plastic jacket, connecting means at each end of said jacket for making electrical and mechanical connections with other sections, stress members within said jacket interconnecting said end coupling means,

and electrical components inside said jacket for receiving and transmitting seismic signals to a signal processor, comprising:

a plurality of bulkheads coupled to cascade to said stress members at regular intervals;

said plurality of bulkheads having means for radially scattering tube-wave noise from said streamer cable section,



comprising: a cylindrical body; multi-faceted surfaces converging at a desired angle of substantially 45°, extending outwards from both ends of said cylindrical body; said bulkhead having an axial hole truncating the vertices of said multi-faceted surfaces for receiving electrical components therethrough; and means for anchoring said stress member to said bulkhead.

4,694,437

SUBTERRANEAN SURVEYING APPARATUS

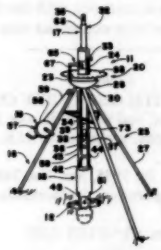
Lowell C. Hanson, P.O. Box 299, Helena, Mont. 59624

Continuation-in-part of Ser. No. 527,100, Aug. 29, 1983, Pat. No. 4,532,545. This application Jul. 26, 1985, Ser. No. 759,261

The portion of the term of this patent subsequent to Jul. 30, 2002, has been disclaimed.

Int. Cl.⁴ G01V *1/00*

U.S. Cl. 367—27 **18 Claims**



1. Subterranean surveying apparatus including a support portion, a connector portion, a housing portion, a positioning portion, a monitoring portion and a control portion; said support portion including a horizontal reference surface, a base section extending downwardly from said reference surface, means for leveling said reference surface; said connector portion including a torsionally rigid mast assembly, said mast assembly being suspended from said reference surface and extending downwardly therefrom, means for selectively fixing the position of said mast assembly with respect to said reference surface, said mast assembly including a plurality of elongated members disposed in an end to end relationship, said elongated members including end sections securable to adjoining ends of other elongated members; said housing portion including an elongated hollow section, the upper end of said hollow section being affixed to the lower end of said mast assembly, at least one opening in said hollow section intermediate the ends thereof, a signal emitting device disposed within said hollow section adjacent said opening; said positioning portion including lifting means mounted on said support portion base section, said lifting means being connected to said housing portion; said monitoring portion including signal display means located adjacent to said support portion, indexing means disposed adjacent to said reference surface, said indexing means being connected to the upper end of said mast assembly for determining the orientation of said signal emitting device; said control portion including control means for said signal emitting device, and a power source for said apparatus; whereby said support portion can be set up over a ground borehole, said housing portion lowered into said borehole and an operator can survey the bottom of said borehole while positioned on the surface adjacent to said apparatus.

4,694,438

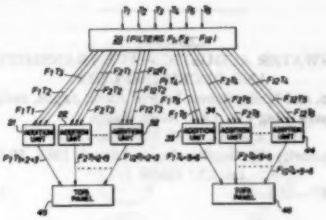
TIME-OFFSET-FREQUENCY-AMPLITUDE PANELS FOR SEISMIC IDENTIFICATION OF HYDROCARBONS

Mrinal K. Sengupta, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed May 2, 1985, Ser. No. 729,508

Int. Cl.⁴ G01V *1/00*; G06F *15/58*

U.S. Cl. 367—70 **18 Claims**



1. A method for producing a display of seismic data, including the steps of:

(a) generating a number of seismic traces, each trace representing an acoustic signal received at a receiver of a receiver array after propagating away from an acoustic source of a source array, and each trace being associated with a common reflecting point and with an offset value equal to the distance between the associated source and receiver;

(b) filtering each trace through a bank of band-pass filters to produce a set of filtered traces, each associated with a common reflecting point, an offset value, and a frequency band; and

(c) displaying at least two of the filtered traces in order of progressively changing offset value, where the displayed filtered traces are associated with a common frequency band.

4,694,439

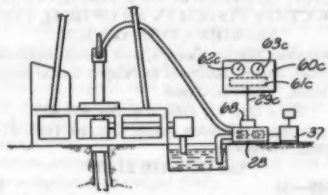
WELL INFORMATION TELEMETRY BY VARIATION OF MUD FLOW RATE

Helmut Moll, Irvine, Calif., assignor to Scientific Drilling International, Houston, Tex.

Continuation of Ser. No. 757,182, Jul. 18, 1985. This application Aug. 11, 1986, Ser. No. 895,135

Int. Cl.⁴ G01V *1/40*

U.S. Cl. 367—83 **16 Claims**



1. Apparatus for conveying information from a downhole

location within a well in which circulating fluid flows in a line extending from the well surface downwardly to said location and then returns to the well surface, comprising:

means for varying the rate of flow of said circulating fluid in said line by controllably operating valving at said downhole location and in correspondence with said information to be conveyed to the surface of the earth;

means for sensing variations in the rate of flow of said fluid near the well surface as an indication of said information;

and motor driven pump means operating to pump the fluid to flow in said line, the motor set to cause the rate of flow from the pump to increase and decrease in correspondence to opening and closing of said valving;

said flow rate sensing means including means for acoustically sensing variations in the speed of operation of the pump means, and including readout means responsive to the sensing means and operable to produce an output representative of or dependent upon the downhole information.

4,694,440

UNDERWATER ACOUSTIC WAVE TRANSMITTING AND RECEIVING UNIT

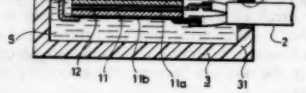
Koji Ogura, and Hideo Sobue, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Apr. 12, 1985, Ser. No. 722,473

Claims priority, application Japan, May 4, 1984, 59-89916

Int. Cl.[4] H04R *1/17*

U.S. Cl. 367—152 **2 Claims**



1. An underwater acoustic wave transmitting and receiving unit comprising: a plate-shaped polarized piezoelectric resonator comprising at least one plate made of a complex of fluorosilicon rubber and lead titanate; and a rubber casing sealed around said resonator, said casing being filled with an insulating liquid matching water around said casing in acoustic impedance, wherein said plate made of a complex of fluorosilicon rubber and lead titanate is manufactured by the process comprising the steps of: rolling a mixture of lead titanate powder and fluorosilicon rubber in a volume ratio of 40 to 80% of lead titanate to fluorosilicon rubber to form a sheet; blanking said sheet to obtain a smaller sheet; vulcanizing the smaller sheet under pressure; vulcanizing the smaller sheet under atmospheric pressure for a longer period of time than under pressure; forming silver electrode layers on opposite sides of th sheet thus treated; and polarizing the sheet.

4,694,441

POSITION CONTROL DEVICE FOR AN OPTICAL REPRODUCTION SYSTEM IN AN OPTICAL TYPE DISC REPRODUCTION DEVICE

Norio Tomisawa; Shingo Kamiya, and Shinji Aoshima, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Filed Oct. 11, 1984, Ser. No. 660,432

Claims priority, application Japan, Oct. 14, 1983, 57-190909; Oct. 14, 1983, 57-190910

Int. Cl.[4] G11B *21/10*

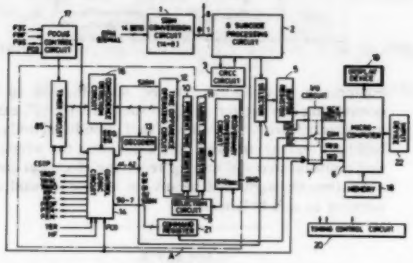
U.S. Cl. 369—32 **8 Claims**

1. A position control device for an optical reproduction system in an optical type disc reproduction device comprising:

means for rotating an optical disc on which a sequence of information is recorded;

an optical reproduction system picking up the recorded sequence of data optically from the rotating optical disc;

a BCD/binary conversion circuit for converting time data of a Q subcode contained in the data picked up by the optical reproduction system from a BCD code into a binary code, said BCD/binary conversion circuit comprising a series/-parallel converter for converting serial BCD code time



data to parallel data, a BCD/binary converter including means for converting the time data of the Q subcode, structured as frame data according to the rate of 75 frames/sec., into time data structured according to a different rate, and a parallel/series converter for converting parallel binary code time data to serial data; and

relative position change means for changing a relative position of said optical reproduction system with respect to said optical disc in accordance with the time data of the Q subcode which has been converted into a binary code.

4,694,442

DISC READER WITH OBLIQUITY CORRECTION

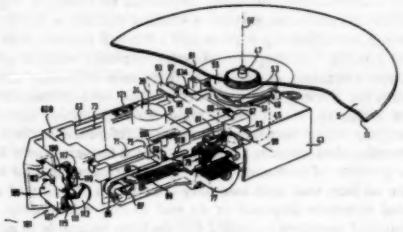
Wilhelmus A. H. Gijzen, and Gerard E. van Rosmalen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 26, 1985, Ser. No. 749,149

Claims priority, application Netherlands, Mar. 4, 1985, 8500592

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—44 **17 Claims**



1. An electro-optical device for recording and/or reading recording tracks in a recording surface of an optically readable disk by means of a radiation beam, the recording surface of the disk being provided with a transparent coating having a plane surface, which electro-optical device comprises:

a frame;

a turntable supporting means for a turntable which is rotatable about an axis of rotation;

an objective supporting means for an objective having an

optical axis, which objective comprises a lens system for concentrating the radiation beam to form a radiation spot,

a focussing actuator for moving the objective along the optical axis,

mechanical guide means for at least one of the supporting means, for moving the objective and the turntable relative to one another in a radial direction between a first position, in which the optical axis and the axis of rotation are situated nearer each other, and a second position, in which said axes are situated more remote from each other, and

correction means for reducing the angle between the optical axis of the objective and the normal to the disk surface at the location of the intersection of the optical axis and the disk surface during the recording and/or reading the recording tracks, whereby an oblique position of said disc surface relative to said optical axis may be corrected,

characterized in that the correction means comprise a tilting device for tilting during the recording and/or reading of the recording tracks at least one of the two supporting means relative to a neutral position about a pivotal axis, which axis extends at least substantially transversely of a plane which is defined by the optical axis and the axis of rotation and which at least in the second position of the objective and the turntable is situated between the axis of rotation and the optical axis, through a tilting angle which is determined by the direction of said normal to said surface of the optical disk.

4,694,443

OPTICAL SYSTEM FOR TRACKING AN INFORMATION RECORDING MEDIUM

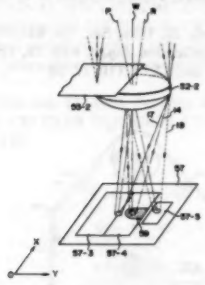
Hideo Ando, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 19, 1985, Ser. No. 713,598

Claims priority, application Japan, Mar. 22, 1984, 59-53524

Int. Cl.[4] G11B 7/00

U.S. Cl. 369—46 **19 Claims**



1. An optical system for tracking an information recording medium having a light reflecting surface, comprising:

means for generating first and second light beams;

an objective lens for converging said first and second light beams onto said light reflecting surface and for converging first and second divergent light beams reflected by said light reflecting surface, a beam spot corresponding to a beam waist of said first light beam being formed on said light reflecting surface when said objective lens is in a just-in-focus state, and a beam spot larger than that of the beam spot corresponding to the beam waist of said first light beam being formed on said light reflecting surface when said objective lens is in an out-of-focus state;

means for directing the reflected first and second light beams from said objective lens, said first reflected light beam being deflected in accordance with the distance between said objective lens and said light reflecting surface; and

a first photodetector with a light receiving surface substantially located on an image forming plane on which an image of the beam spot corresponding to the beam waist of the first light beam is formed, said light receiving surface including first and second photosensitive regions and a photoinsensitive region, the reflected first light beam being directed between said first and second photosensitive regions when said objective lens is in the just-in-focus state and directed to one of said first and second photosensitive regions when said objective lens is in the out-of-focus state, and the second light beam being directed toward said photoinsensitive region when said objective lens is in the just-in-focus state.

4,694,444

RECORD DISC REPLACING MEANS

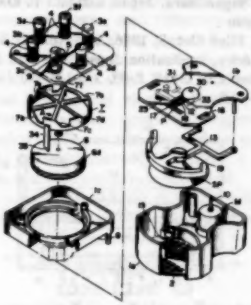
Eishi Koike, Sagamihara, Japan, assignor to Ozen Corporation, Tokyo, Japan

Filed Aug. 13, 1986, Ser. No. 895,958

Claims priority, application Japan, Aug. 31, 1985, 60-192330

Int. Cl.[4] A63H 3/33; G11B 3/00

U.S. Cl. 369—65 **3 Claims**



1. A record disc replacing means for use in a selective reproduction type of sound reproduction device, comprising:

a casing;

a turn table disposed inside the casing capable of changeably carrying a record disc on a face thereof, said record disc having a plurality of recorded grooves thereof and a centering hole at the center thereof; said plurality of recorded grooves each having a starting and stopping point of sound reproduction;

a pickup normally biased toward the starting point of sound reproduction;

a sound transmitting member which carries a speaker diaphragm and resiliently contacts said pickup to impart stylus force thereto;

a plurality of selection poles corresponding in number to that of said recorded grooves, said plurality being disposed around the outer periphery of said turn table;

a stopper radially and outwardly projecting from the outer periphery;

a motor; whereby depression of any one of said plurality of selection poles raises said sound transmitting member and releases the stylus force imparted to said pickup and allows it to revert back to the staring point of sound reproduction, while at the same time said depressed selection pole strikes the stopper to temporarily stop said record disc under rotation whereby the starting point of the corresponding groove can stop at a position where said pickup can engage said starting point, and whereby the pickup will engage the switch at the stopping point to turn off the motor;

a power source;

said motor connected to the power source, said motor further comprising an output shaft;

means of coupling the output shaft to the turntable to rotate the turntable and a record disc carried thereon;

a switch engageable with the pickup at the stopping point of sound reproduction to turn off the power source;

a slit for inserting a record disc formed through the casing therein defining two openings on opposite sides thereof parallel with said record carrying face of said turn table;

at least one stylus force releasing projection carried by the sound transmitting member and disposed near one of the two openings of the slit and projecting thereinto;

a centering projection resiliently supported in said casing, and disposed adjacent the center of said slit and projecting thereinto;

a resiliently protruding record disc locking projection carried by the record disc carrying face of said turn table; and

a notch engageable with said record disc locking projection disposed on said record disc to lock the record disc to the record disk carrying face.

4,694,445

RECORD DISC REPLACING MEANS FOR A SELECTIVE PLAYING TYPE SOUND REPRODUCING DEVICE

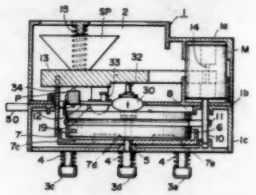
Eishi Koike, Sagamihara, Japan, assignor to Ozen Corporation, Tokyo, Japan

Filed Oct. 9, 1986, Ser. No. 917,218

Claims priority, application Japan, Nov. 20, 1985, 60-260947

Int. Cl.[4] G11B *3/08, 3/40, 3/78, 19/20*

U.S. Cl. 369—65 **3 Claims**



1. A simplified sound reproducing device having means for selectively reproducing sound recordings and means for replacing a record disc, the record disc having a centering hole at the center thereof, a plurality of recorded grooves and at least one starting point of sound reproduction, the simplified sound reproducing device comprising:

a casing;

a turn table having an outer periphery, a stopper projecting radially and outwardly from the outer periphery, and a record carrying face, the turn table capable of carrying the chosen record disc rotatably mounted within the casing;

a tone arm pivotally mounted to the casing, the tone arm located parallel to the record carrying face of the turn table and pivotal between the starting point and an ending point of sound reproduction;

means for biasing the tone arm toward the starting point of sound reproduction;

a pickup located on the tone arm;

a sound transmitting member attached to the casing and resiliently contacting said pickup to impart a stylus force. the sound transmitting member having at least one stylus force releasing projection;

a speaker diaphragm mounted on the sound transmitting member;

a plurality of selection poles corresponding in number to that of said recorded grooves, the selection poles extending through the casing and movable thereto, the selection poles disposed to surround the outer periphery of the turn table, the selection poles positioned such that depression on any one of said selection poles raises said sound transmitting member and releases the stylus force imparted to said pickup and allows its reverting back to the starting point of sound reproduction, and at the same time, said selection pole in depressed position strikes the stopper to temporarily stop said record disc under rotation so that an introductory part of the selected groove can stop at the position where said pickup can engage the introduction part:

a power source;

a motor powered by the power source capable of rotating the turn table;

an electric circuit located between the power source and the motor capable of supplying power to the motor to operate the turn table upon arrival of the pickup at the starting point of sound reproduction;

a record disc insertion slit formed within said casing such that a communication through the casing is established, the record disc insertion slit oriented in parallel with the record carrying face of said turn table, wherein the stylus force releasing projection is located at an inlet for the record disc insertion slit;

a centering projection resiliently supported in the casing located at an inner part of the record disc insertion slit such that both the stylus force releasing projection and the centering projection are positioned to intersect the record disc insertion slit;

a depressible ejector lever extending outside the casing and along the record disc insertion slit and able to eject, when depressed, both the stylus force releasing projection and the record disc under engagement with the centering projection;

a resiliently protruding record disc locking projection located on the record disc carrying face of the turn table; and

a notch engageable with the record disc locking projection is disposed on the record disc.

4,694,446

SIMPLIFIED SOUND REPRODUCING DEVICE OF RANDOM SELECTING TYPE

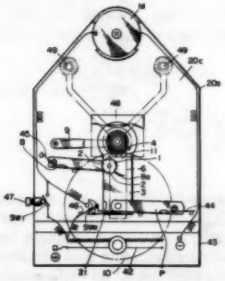
Eishi Koike, Sagamihara, Japan, assignor to Ozen Corporation, Tokyo, Japan

Filed Feb. 26, 1986, Ser. No. 833,918

Claims priority, application Japan, Feb. 28, 1985, 60-39040

Int. Cl.[4] G11B *17/06*

U.S. Cl. 369—67 **11 Claims**



1. A simplified sound reproducing device of random selection type comprising:

a casing;

a speaker diaphragm having a top and bottom portion;

a sound transmitting member attached to the bottom of said speaker diaphragm;

a record disc having a starting point and end point of sound reproduction for each of a plurality of record grooves;

a motor for driving said record disc;

a pickup interposed between the sound transmitting member and the record disc, the pickup normally urged resiliently toward the starting point of sound reproduction and away from the recorded face of said record disc;

a stylus force spring imparting resilient stylus force to said pickup;

a center gear having a plurality of teeth disposed at the central part of said record disc rotatable together with said record disc;

a swing arm for releasing stylus force swingably disposed near the end point of sound reproduction so as to be extended to the path of rotation of said pickup, the swing arm normally urged toward the starting point of sound reproduction;

a free gear carried by the swing arm and rotatable by the driving force transmitted from the record disc through the center gear when the swing arm has been urged by the pickup and has moved toward the center gear, thereby carrying the free gear into engagement with the center gear, the free gear having a plurality of teeth, at least one of which has a tooth crest in the direction of rotation longer than the other teeth such that said longer tooth crest can contact any tooth crest of the teeth of the mating center gear, and stop rotation of both the free gear and the center gear; and

a stylus force releasing mechanism interposed between the sound transmitting member and the record disc, the stylus force releasing mechanism having a cam member including an upper cam piece and a lower cam piece axially stacked one on another, the upper cam piece being releasably coupled to the center gear, the cam member initiating cam action for releasing the stylus force applied to the pickup by widening a space located between said sound transmitting member and said record disc when the free gear has advanced to the position where it engages the center gear and stops rotation of the free gear against the driving force imparted by the center gear, thereby causing the cam member to elongate due to twisting and cam action.

4,694,447

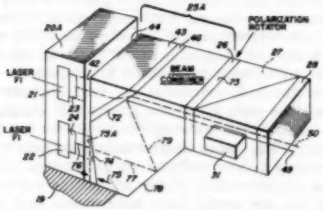
OPTICAL SIGNAL RECORDERS EMPLOYING TWO LASERS AND METHODS THEREFOR

Donald K. Cohen, and Raymond Yardy, both of Tucson, Ariz., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jul. 12, 1984, Ser. No. 630,456

Int. Cl.[4] G11B *7/00;* **G02B** *27/14, 5/04*

U.S. Cl. 369—110 **33 Claims**



1. In an optical head for an optical disk recorder, the improvement comprising:

first and second lasers for emitting first and second light beams of substantially the same frequency and light beam intensity;

circuit means connected to said first and second lasers for operating both said lasers at a same power level;

thermal mounting means mounting said first and second lasers in high thermal conductive relationship such that the temperature of operations of the first and second lasers tend to be similar;

a polarization-insensitive beam combiner having amorphous optical materials and being optically coupled to the lasers for transferring both the beams along a single light path without altering the polarization of the two light beams and in a slightly diverging relationship, means in said combiner for attenuating the light beam intensity of said first light beam sufficiently to enable the attenuated light beam to read recorded information on an optical disk without altering the recording thereon; and

optical means in said single light path for introducing identical polarization changes to both said beams and a polarization-sensitive beam splitter optically interposed between said combiner and optical means for directing reflected light beams derived from said first and second light beams into two diverging light paths for enabling detection of one of said two reflected light beams and wherein said beam combiner has a first optical element consisting of a predetermined amorphous optical material and having a first surface (36) angled with respect to said emitted first and refract said emitted first light beam and being a part of said attenuator means and having a second input surface (37) disposed to receive said second light beam such that said first surface intercepts the second light beam and internally reflects the second light beam but not as a part of said attenuator means, said refraction and reflection directing the light beams along a given light path having a major axis and said refracted and reflected light beams having a predetermined small angle of divergence and wherein said first optical element further includes an internal reflection surface optically interposed between said first angled srface and said second laser such that said second light beam is internally reflected a plurality of times within said first optical element; and

said first and second lasers being disposed with respect to each other to emit substantially parallel beams of light.

4,694,448

DISC CASE

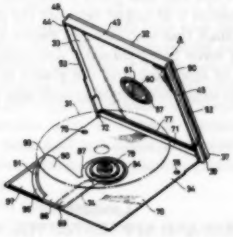
Takuya Tamaru, and Mikio Ogusu, Hamamatsu, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed May 8, 1985, Ser. No. 731,909

Claims priority, application Japan, May 15, 1984, 59-070479; Jun. 1, 1984, 59-081526; Jun. 1, 1984, 59-081527

Int. Cl.[4] G11B *17/24, 23/04;* **B65D** *85/54*

U.S. Cl. 369—291 **11 Claims**



1. A disc case for removably housing a disc on which data has been recorded and for supporting the disc rotatably in said case so that said case can be disposed in reproducing apparatus of the type having means for reproducing the data stored on the disc whereby the reproducing apparatus can reproduce the data while the disc is housed in said case, the case comprising a first plate having sides and depending side walls with one of said side walls having a groove formed therein with said groove having a bottom surface and a rack formed on said bottom surface for cooperating with a loading mechanism of the reproducing apparatus, a second plate having sides one of which is hingedly connected to said first plate along one of the sides thereof so that said plates are movable between open and closed positions.

4,694,449

RECORD PLAYER WITH A SQUARE, VISCOUSLY DAMPED PICK-UP ARM LIFT ROD

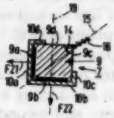
Hermanus F. Einhaus, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 2, 1985, Ser. No. 751,418

Claims priority, application Netherlands, Jul. 6, 1984, 8402144

Int. Cl.[4] G11B 3/08, 17/06, 21/12

U.S. Cl. 369—246 9 Claims



1. A record player comprising:

a deck plate,

a turntable and a pick-up arm carried on said deck plate, and

a lifting device which can be moved upwards and downwards to lift and lower the pick-up arm relative to the upper side of the turntable, said lifting device comprising an arm support, a lift rod, damping means, a guide element connected to the deck plate, and an actuating member,

said lift rod forming an integral unit with said support and being guided by said guide element, and cooperating with said actuating member for moving the lifting device upwards and downwards, and

said damping means comprising a highly viscous substance for damping at least the downward movement of the lifting device,

characterized in that the lift rod comprises a pair of longitudinal peripheral walls defining planes which are arranged at an angle with each other so as to define a line of intersection, and engage a corresponding pair of guide walls of the guide element,

the guide element forms an integral unit with the deck plate,

the highly viscous substance is retained between said walls of the lift rod and said guide walls, and

a spring element is arranged between the deck plate and the lift rod, such that said element exerts a force on the lift rod, said force being directed downwardly and towards said line of intersection of the planes of said walls of the lift rod to urge these walls against said guide walls.

4,694,450

METHOD AND APPARATUS FOR ADAPTIVE RECEIVER SQUELCH ECHO CONTROL

Hans P. Staab, 281 Ridge Rd., New Milford, Conn. 06776

Filed May 31, 1984, Ser. No. 616,017

Int. Cl.[4] H04J 15/00; H04L 5/14; H04B 3/20

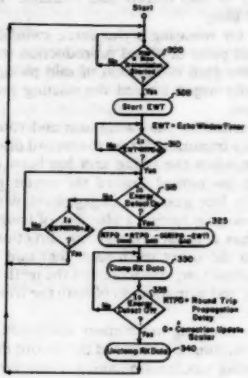
U.S. Cl. 370—32.1 4 Claims

1. A method of minimizing echo problems in communication between an originate modem and an answer modem interconnected by a communication line comprising the steps of:

measuring at the originate modem, the answer modem, or both, the round trip propagation delay of the communication line interconnecting the modems,

using said round trip propagation delay during subsequent data transmission over said communication line to determine when to expect an echo on said communication line from a data message transmitted by one of said modems,

monitoring the communication line at the time when the echo is expected at the transmitting modem, and



squelching a receiver at said transmitting modem while the echo is detected.

4,694,451

ADAPTIVE DIGITAL FILTER

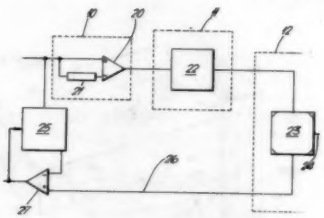
Peter F. Adams, Ipswich, England, and Colin F. N. Cowan, Edinburgh, Scotland, assignors to British Telecommunications public limited company, Great Britain

Filed Jan. 10, 1985, Ser. No. 690,193

Claims priority, application United Kingdom, Jan. 12, 1984, 8400791

Int. Cl.[4] H04J 15/00; H03H 7/30; G06F 7/38

U.S. Cl. 370—32.1 6 Claims



1. A digital filter comprising:

a plurality of delay stages for receiving, delaying and then outputting an input digital signal,

a plurality of individually addressable random access memory devices for storing respective data values therein,

means for addressing and accessing stored data values in each of said memory devices, said means for addressing and accessing each said memory device being connected to receive the output from at least two of said delay stages,

means for combining the thus addressed outputs read from said memory devices to provide a filter output signal, and

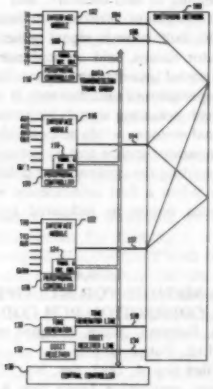
means for processing the filter output signal to provide an error signal which may be used to adapt the data values stored within said memory devices so as to minimize said error signal.

4,694,452

SWITCHING CONFIGURATION FOR A TELECOMMUNICATIONS SYSTEM IN PARTICULAR A PBX SYSTEM WITH SUBSCRIBER LINES, TRUNK GROUPS, AND INTERFACE MODULES

Günther Beckinger, Unterpfaffenhofen; Gerhard Egler, and Thomas Rambold, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 562,509, Dec. 16, 1983, abandoned.
This application May 14, 1986, Ser. No. 865,922
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247598; Jan. 21, 1983, 33011979; Jan. 21, 1983, 3301996; Jan. 21, 1983, 3301966; Jan. 28, 1983, 3302920
Int. Cl.[4] H04Q 11/04
U.S. Cl. 370—58 6 Claims



1. A switching configuration for a telecommunications system, with subscriber lines and trunk groups, in which respective groups and combined subscriber line/trunk groups are each connected via a common interface module for such groups, both to a speech path switching network and, via a data transmission trunk group, to a central controller provided to establish paths for seized incoming and outgoing subscriber lines and trunks, and in which information is transmitted via the speech path switching network using pulse code modulation, information being transmitted via said data transmission trunk group in a message format using a variable data length, and wherein an interface circuit is assigned to each interface module for the purpose of transmitting information to or receiving information from the subscriber lines and/or trunk circuits, buffering this speech and signal data, and for status monitoring, said switching configuration comprising:

an internal data transmission trunk group and a peripheral controller assigned to the interface module connected to the interface circuit, the speech path switching network and the data transmission trunk group via said internal data transmission trunk group such that the transmission of speech and signal information is based upon control commands of said central controller and said peripheral controller; timer and control switching means assigned to said interface module and being coupled to said internal data transmission trunk group for transmitting and receiving speech information in pulse-code form;

a transmitting and receiving device assigned to said data transmission trunk group and being adapted to receive and transmit information between said central controller and said peripheral controller using a message format with variable data length, said transmitting and receiving device being further assigned to said interface module, and being coupled to said internal data transmission trunk group; and

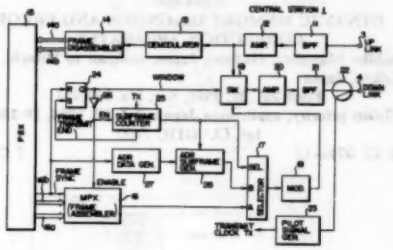
a memory linked to said internal data transmission trunk group, being capable of receiving information in a message format with variable data length and being assigned to said interface module, for buffering said information and sending it to said transmitting and receiving device based upon said peripheral controller, said information being made available based upon said timer and control switching equipment assigned to said interface module for one of (a) transmitting signals via the speech path switching network in pulse-coded form and (b) converting pulse-coded signals received via said speech path switching network.

4,694,453

SYSTEM FOR ADJUSTING SIGNAL TRANSMISSION TIMING IN TIME-DIVISION MULTIPLEXING SIGNAL TRANSMISSION

Hiroshi Kobayashi, Tokyo; Hideaki Haruyama, Yokohama, and Tsuguhiro Hirose, Nakamachi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 18, 1985, Ser. No. 810,092
Claims priority, application Japan, Dec. 20, 1984, 59-268824
Int. Cl.[4] H04J 3/02, 1/16
U.S. Cl. 370—85 5 Claims



1. A communication network system comprising:

a central station;

a plurality of local stations coupled to different positions on a signal transmission path one end of which is coupled to said central station, wherein subframe information signals addressed to the respective local stations are transmitted over said signal transmission path from said central station to said local stations during a data period of one frame transmission interval including the data period and a window period following the data period, and subframe information signals are transmitted from said local stations to said central station over said signal transmission path during a data period of one frame transmission interval including the data period and a window period following the data period;

said central station comprising,

information signal transmission means for transmitting over said signal transmission path, on a time division multiplexing basis, subframe information signals addressed to the respective local stations during the data period of one transmission frame interval,

test-signal transmission-request means for transmitting over said signal transmission path a test-signal transmission-request signal, addressed to one of said local stations, subsequent to the last subframe information signal transmitted during the data period of one frame transmission interval,

test signal sendback means for sending a test signal back to a local station which transmitted the test signal over said signal transmission path;

each of said local stations comprising,

information signal detecting means for detecting a subframe

information signal transmitted from said central station and addressed to itself,

test signal transmission means responsive to a test-signal transmission-request signal transmitted from said central station and addressed to itself for transmitting a test signal to said central station during the window period of one transmission frame interval,

test signal detecting means for detecting the test signal sent back from said central station,

transmission delay time measuring means responsive to said test signal transmission means and said test signal detection means for measuring a transmission delay time required from the transmission of the test signal to the reception of the test signal sent back from said central station, and

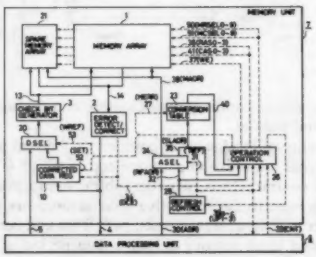
information signal transmission means responsive to said transmission delay time measuring means and said information signal detection means for transmitting a subframe information signal to said central station over said signal transmission path after a waiting time, depending on a time duration of one transmission frame interval and the transmission delay time measured by said transmission delay time measuring means, from a time of the reception of the subframe information signal addressed to itself.

4,694,454

DYNAMIC MEMORY DIAGNOSIS AND ERROR CORRECTION APPARATUS

Yasuhiko Matsuura, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 29, 1985, Ser. No. 759,954
Claims priority, application Japan, Jul. 27, 1984, 59-155536
Int. Cl.[4] G11C *7/00*
U.S. Cl. 371—13 **7 Claims**



1. A diagnosis and error correction apparatus for a dynamic memory which has a plurality of locations identified by respective addresses and which requires periodic refresh operations to prevent its stored data from gradually degenerating, comprising:

an error detect/correct circuit connected to receive data read out of said memory for detecting errors and correcting correctable errors in said data;

a data register operatively connected to said error detect-/correct circuit for storing output data from said error detect/correct circuit;

a refresh control circuit including refresh signal generating means for generating refresh actuating signals at predetermined intervals, and refresh address generating means responsive to said refresh actuating signals for generating in synchronism with said refresh actuating signals successive memory addresses as refresh addresses which are sent to said memory to address the locations of said memory for refreshing; and

an operation control circuit connected to said error detect-/correct circuit, said data register and said refresh circuit, and including:

(a) control signal generating means for generating control signals to be supplied to said memory for controlling memory operations,

(b) an address register operatively connected to said refresh address generating means and said error detect-/correct circuit for storing the refresh address generated by said refresh address generating means at the time when a correctable error is detected by said error detect/correct circuit during refreshing of said memory,

(c) comparator means for comparing the content of said address register with said successive refresh addresses generated by said refresh address generating means to detect a coincidence between the content of said address register and any one of said refresh addresses,

(d) a coincidence counter operatively connected to said comparator means for counting the number of times coincidence is detected by said comparator means during refreshing of said memory, and

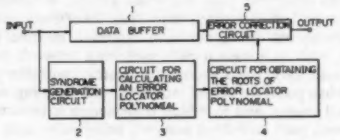
(e) refresh operation directing means operatively connected to said refresh signal generating means, said comparator means, said coincidence counter and said control signal generating means for controlling the refresh operation of said memory in response to each of said refresh actuating signals by actuating a read operation of said memory while no coincidence is detected by said comparator means and by actuating a write operation for writing the content of said data register into said memory when a first coincidence is detected by said comparator means as indicated by said coincidence counter.

4,694,455

DECODING METHOD FOR MULTIPLE BIT ERROR CORRECTION BCH CODES

Keiichiro Koga, Saitama, Japan, assignor to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Sep. 4, 1985, Ser. No. 772,504
Claims priority, application Japan, Sep. 4, 1984, 59-183755
Int. Cl.[4] G06F *11/12*
U.S. Cl. 371—37 **5 Claims**



1. An error correcting code decoding method wherein a received code word $Y=(Y_1, Y_2, \cdots, Y_n)$ is corrected, said method comprising the steps of:

calculating the syndrome vector $(S_1, S_2, \cdots, S_{2t})=YH^t$ where H is the parity check matrix;

calculating Q_t, a symmetry determinant of order t whose elements are chosen systematically from amont syndromes, and determinants derived from Q_t by means of first specifying some diagonal elements of Q_t and then removing all the pairs of a row and a column of Q_t sharing one of the specified diagonal elements from Q_t (these derived determinants, together with Q_t, are generally termed "Q determinants");

determining the coefficients of an error locator polynomial from said Q determinants; and

locating the error bit positions of said received code word Y by calculating the roots of the error locator polynomial and correcting them;

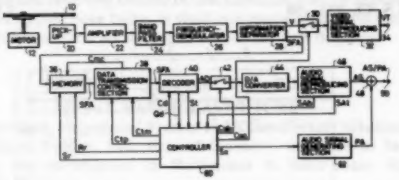
wherein said Q determinants are obtained by holding the values of Q determinants already calculated in a storage facility, and calculating, in a calculating facility, the product of a Q determinant stored in said storage facility with the square of syndrome one by one for a predetermined Q determinant-syndrome combination set, adding them up, and storing the result in said storage facility as a new Q determinant.

4,694,456

INFORMATION SIGNAL REPRODUCING APPARATUS

Kazuyuki Morita, and Toru Otsuka, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 20, 1985, Ser. No. 811,822
Claims priority, application Japan, Dec. 28, 1984, 59-277554
Int. Cl.[4] G06F 11/10
U.S. Cl. 371—38 7 Claims



1. An information signal reproducing apparatus comprising:
memory means for storing encoded digital data and error correcting data;
decoding means responsive to said memory means for decoding said digital data, producing decoded digital data organized in blocks, and delivering the decoded digital data one block at a time,
data transmission control means for controlling transmission of the digital data from said memory means to said decoding means;
analog information signal procesing means responsive to said decoding means for forming a reproduced analog information signal in accordance with each of the blocks of the decoded digital data supplied thereto,
data supply control means for controlling supply of each block of the decoded digital data from said decoder means to said analog information signal processing means, and
operation control means including first control means for controlling said data transmission control means to transmit the digital data read from said memory means successively to said decoding means and inactivating said data supply control means, so as to cause said decoding means to perform trial decoding of the digital data, and second control means for controlling said data transmission control means to transmit the digital data read from said memory means intermittently to said decoding means and activating the data supply control means, so as to cause said decoding means to perform actual decoding of the digital data after said trial decoding is completed.

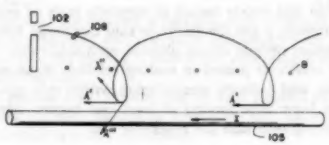
4,694,457

METHODS OF STEERING AND FOCUSING ION AND ELECTRON BEAMS

John C. Kelly, Turramurra, and Glenn W. Kentwell, Waverley, both of Australia, assignors to Unisearch Limited, Kensington, Australia

Continuation of Ser. No. 515,242, Jul. 19, 1983. This application Dec. 26, 1985, Ser. No. 813,452
Claims priority, application Australia, Jul. 20, 1982, PF4955
The portion of the term of this patent subsequent to Jun. 9, 2004, has been disclaimed.
Int. Cl.[4] H01S 3/00
U.S. Cl. 372—2 21 Claims

1. A method for steering or focussing beams such as ion or electron beams with a magnetic field, the method comprising:
generating a large electric current in a straight conducting wire;



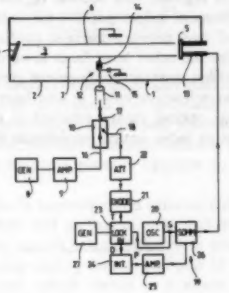
projecting charged particles in proximity with the conducting wire;
deflecting the charged particles by generating in proximity with the wire a circular magnetic field;
confining each of the charged particles to a path which extends in a direction substantially coplanar with the conducting wire wherein a deflecting force generated by the coaxial magnetic field is exerted on each particle in the plane defined by the conducting wire and the path of the particle.

4,694,458

DEVICE FOR FREQUENCY STABILIZING AN RF EXCITATION LASER

Thierry, R. Midavaine, and Michel M. Ouhayoun, both of Paris, France, assignors to S.A.T. (Societe Anonyme de Telecommunications), Paris, France

Filed Jun. 12, 1985, Ser. No. 743,746
Claims priority, application France, Jun. 19, 1984, 84 09593
Int. Cl.[4] H01S 3/13
U.S. Cl. 372—32 10 Claims



1. A device for stabilizing the frequency of an RF excitation laser comprising:
a resonant cavity having at least two mirrors filled with the laser gas and having an impedance;
an RF radio-frequency alternating power generator for generating an excitation signal having an output impedance;
electrodes for exciting the laser gas connected to the generator;
means for causing the frequency of the laser to vary;
means, connecting said generator and said electrodes, for matching the impedance of the laser cavity to the output impedance of said generator; and
means responsive to an impedance mismatch signal reflected by the cavity, for controlling said causing means to vary said frequency through a servo-control circuit.

4,694,459

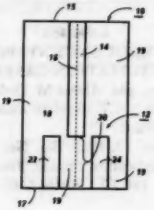
HYBRID GAIN/INDEX GUIDED SEMICONDUCTOR LASERS AND ARRAY LASERS

Robert D. Burnham, Palo Alto; Thomas L. Paoli; Donald R. Scifres, both of Los Altos, and William Streifer, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 31, 1985, Ser. No. 739,805
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—45 31 Claims

1. A hybrid index/gain guided semiconductor laser comprising a plurality of contiguous semiconductor layers deposited on a substrate, one or more of said layers forming an active region having a lower bandgap and higher index of refraction relative to at least cladding layers immediately adjacent thereto, said active region approximate to a p-n junction when, upon forward biasing via primary current confinement means,

permitting carrier recombination in at least one portion thereof and supporting radiation propagation under lasing conditions in an optical cavity established between transverse end facets of the laser beneath said primary current confinement means, said laser having at least two regions of current confinement means, the first of said regions containing said primary current confinement means and comprising a single current confinement stripe and extending from one laser facet toward the



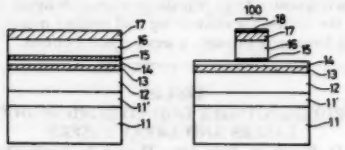
second of said regions, said second region having a pair of current confinement stripes parallel but axially offset relative to the axis of said primary current confinement stripe and extending from the other laser facet toward said first region, said axially offset current confinement stripes providing regions of lower refractive index in said laser compared to the region of said optical cavity established therebetween and functioning as an index optical waveguide for said laser.

4,694,460

STRIPE GEOMETRY SEMICONDUCTOR LASER DEVICE

Toshiro Hayakawa; Takahiro Suyama, and Saburo Yamamoto, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 18, 1985, Ser. No. 725,094
Claims priority, application Japan, Apr. 26, 1984, 59-86700
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 **17 Claims**



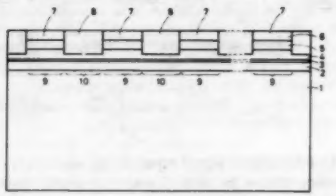
1. In a stripe geometry semiconductor laser: a multi-layered crystal structure having a substrate and an active layer for laser oscillation; an etching blocking layer on said multi-layered crystal structure; and a striped mesa-type multi-layered crystal, including a cladding layer, which serves as an electroconductive region and is disposed on said etching blocking layer, resulting in a difference in the distribution of the refractive index of light with regard to the active layer between the inside and the outside of said striped mesa-type multi-layered crystal.

4,694,461

SEMICONDUCTOR LASER ARRAY

Seiki Yano, Kashihara; Saburo Yamamoto, Nara; Sadayoshi Matsui, Tenri, and Mototaka Taneya, Sakai, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 8, 1985, Ser. No. 700,018
Claims priority, application Japan, Feb. 28, 1984, 59-39144
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—50 **7 Claims**



1. A semiconductor laser array having a stable operation and a high power output comprising:

a substrate;

a clad layer formed on said substrate;

an active layer formed on said substrate;

an optical guide layer formed on said active layer;

a plurality of mesa stripes formed on said optical guide layer, each mesa stripe being separated from the next mesa stripe by a groove extending into said optical guide layer, an optical coupling region having a high a mole fraction in each said groove; and

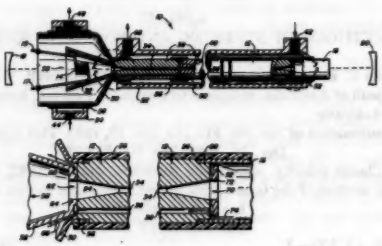
current injection means for injecting current into said active layer through said plurality of mese stripes, wherein each laser emitting region defined by said mesa stripes is optically, phase connected to the next laser emitting region with a phase difference of zero degrees.

4,694,462

LASER WITH BYPASS GAS DEFLECTOR

Ronald E. Jones, Cupertino, Calif., and Royal D. Peterson, Alpharetta, Ga., assignors to Continental Laser Corporation, Mountain View, Calif.

Filed Dec. 13, 1985, Ser. No. 808,863
Int. Cl.[4] H01S *3/03*
U.S. Cl. 372—61 **15 Claims**



1. A gas laser comprising,

a laser tube having a longitudinal discharge bore therethrough, said tube containing a gas capable of lasing action,

cathode and anode means at opposite ends of said tube for sustaining a gas discharge in said discharge bore,

a resonant optical cavity aligned with said tube,

a gas reservoir joined in sealing relation to an end of said tube, said cathode means being within said gas reservoir, said laser tube having at least one bypass bore with an opening into said gas reservoir and

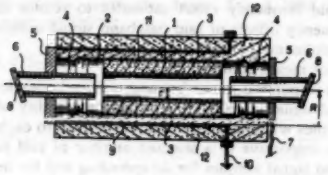
a first bypass gas deflector mounted in said reservoir and having a deflector interior region, said first deflector having an open end and an opposite aperture end, said first deflector surrounding at least a portion of said cathode means, said aperture end having an aperture, said first deflector being connected to said tube with said aperture aligned with said discharge bore, said bypass bore opening into said reservoir outside of said deflector interior region, said bypass bore being in fluid communication with said discharge bore via said open end of the first detector.

4,694,463

METAL VAPOR LASER TUBE

Antoine Hirth, Hegenheim, France, and Klaus-Herbert Schetter, Grenzach-Wyhlen, Fed. Rep. of Germany, assignors to Institut Franco-Allemand de Recherches de Saint-Louis, St. Louis, France

Filed Jun. 4, 1986, Ser. No. 870,384
Claims priority, application France, Jun. 5, 1985, 85 08457
Int. Cl.[4] H01S *3/03*
U.S. Cl. 372—61 **4 Claims**



1. A metal vapor laser tube comprising a cylindrical plasma tube (1), which is located in a leak-proof container (2), said plasma tube being surrounded by a thermal insulating material, electrodes (6) disposed at each end of the plasma tube supplying a current pulse to a plasma located within said plasma tube and a cylindrical return conductor (9) which is located coaxial to the plasma tube (1) and which is connected with one of the electrodes, characterized in that the conductor (9) has a radius R of about:

$$\frac{107}{e^{\frac{4\pi r^2}{}}} \frac{dE}{dV} \left(\frac{ro}{U}\right)^2$$

where:

e=exponential function,

r=radius of the plasma tube, expressed in centimeters,

dE/dV=energy density of the plasma, expressed in millijoules per cubic centimeter,

ro=specific resistance of the plasma, expressed in Ohms×centimeter,

U=electrical field, expressed in volts per centimeter; thereby producing impedence matching of said laser tube so as to obtain an electric discharge without oscillation of said current supply pulse.

4,694,464

PLASMA ARC HEATING APPARATUS AND METHOD

Salvador L. Camacho, Raleigh, N.C., assignor to Plasma Energy Corporation, Raleigh, N.C.

Filed Jul. 30, 1986, Ser. No. 892,081
Int. Cl.[4] H05H *1/00*; H05B *7/00*
U.S. Cl. 373—22 **8 Claims**

1. An apparatus for heating a metallic melt which is adaptable to efficient starting and operation and comprising:

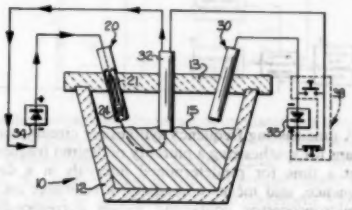
a furnace chamber having a hearth for receiving a metallic melt and the like;

a pair of plasma torches mounted to said furnace chamber for initiating and sustaining a plasma arc, each plasma torch including a rear electrode;

an external electrode mounted to said furnace chamber so as to be adapted to contact the metallic melt in the hearth;

a first direct current power supply means mounted externally of said furnace chamber and having an anode connected to said rear electrode of one of said plasma torches and a cathode connected to said external electrode, and such that a first circuit may be established between said first power supply means, said one plasma torch, the metallic melt, and said external electrode; and

a second direct current power supply means mounted externally of said furnace chamber and having a cathode connected to said rear electrode of the other of said plasma



torches and an anode connected to said external electrode, and such that a second circuit may be established between said second power supply means, said other plasma torch, the metallic melt, and said external electrode, and with the second circuit having a polarity opposite to that of said first circuit;

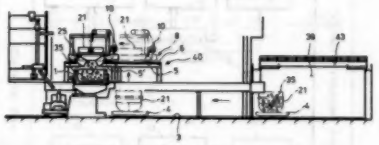
means for selectively removing said external electrode from each of said first and second circuits and establishing a single operating circuit which includes in series said first and second power supply means, said pair of torches, and the metallic melt which serves to conduct current between said pair of torches.

4,694,465

APPARATUS FOR AUTOMATICALLY CHARGING SCRAP INTO AN ARC FURNACE

Toshio Nanjo, Itabashi, and Fumio Tomizawa, Yokohama, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 626,243, Jun. 29, 1984. This application Feb. 27, 1986, Ser. No. 833,599
Claims priority, application Japan, Nov. 16, 1983, 58-215791
Int. Cl.[4] F27D *3/06*
U.S. Cl. 373—81 **3 Claims**

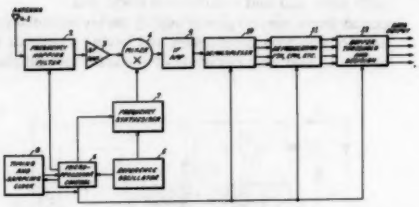


1. An apparatus for automatically charging scrap into a shroudless arc furnace, comprising: a scrap bucket open at the top, a bucket carriage on which said scrap bucket is loaded, said bucket carriage being normally positioned at a stand-by position which is adjacent to the arc furnace and which is at a height or level just sufficient for travel of the bucket to above the furnace for directly charging the scrap into the furnace, a structure including beams extended between said stand-by position and said arc furnace, said bucket carriage riding on said beams, and a mechanism for traversing said scrap bucket between said stand-by position and said are furnace.

4,694,466
TIME SHARING FREQUENCY SYNTHESIZER

Joseph Kadin, Morris, N.J., assignor to ITT Defense Communications, a Division of ITT Corporation, Nutley, N.J.

Filed Jun. 3, 1985, Ser. No. 740,603
Int. Cl.[4] H04L 27/26
U.S. Cl. 375—1 7 Claims

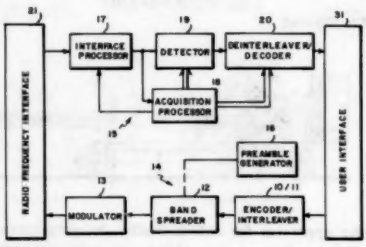


1. A time sharing frequency synthesizer circuit, comprising:
means for synthesizing a plurality of desired frequencies one at a time for predetermined intervals in a desired sequence, said means comprising a reference oscillator, a microprocessor containing values corresponding to a table of desired output frequencies for a frequency synthesizing device, said microprocessor being connected to an output of said reference oscillator, and a frequency synthesizer which is connected to an output of said reference oscillator and an output of said microprocessor and which contains circuitry for converting the output of said reference oscillator into any desired frequency,
means for heterodyning each of said desired frequencies with one or more signals with frequencies within a desired bandwidth to generate intermediate frequencies at a sample rate consistent with the Nyquist criteria of sampling at a frequency at least twice the effective bandwidth; and
means for discriminating among said intermediate frequencies.

4,694,467
MODEM FOR USE IN MULTIPATH COMMUNICATION SYSTEMS

Shou Y. Mui, Cherry Hill, N.J., assignor to Signatron, Inc., Lexington, Mass.

Filed Jul. 3, 1986, Ser. No. 881,611
Int. Cl.[4] H04B 7/00
U.S. Cl. 375—1 12 Claims

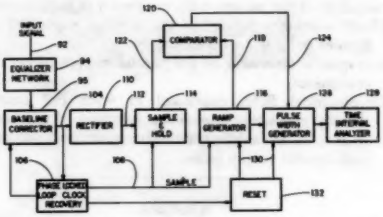


1. A modem for use in communication systems used for transmitting and receiving information bits, said modem comprising
a transmitter including
spectrum spreading means responsive to a plurality of sequentially supplied input information bits for providing a plurality of spread spectrum information bits, a first group thereof having spread spectrum characteristics in accordance with a first spread spectrum sequence and a second group thereof having spread spectrum characteristics in accordance with a second spread spectrum sequence which differs from said first spread spectrum sequence;
modulation means for modulating said plurality of spread spectrum information bits to provide a modulated transmitter signal;
means for generating a preamble signal;
means for sequentially transmitting said preamble signal and said modulated transmitter signal;
a receiver including
means for receiving said preamble signal and said modulated transmitter signal;
processing means including
means responsive to said preamble signal for processing said preamble signal to provide estimates of the frequency offsets of said received preamble signal;
means responsive to said modulated receiver signal for generating complex baseband signal samples; and
means responsive to said frequency offset estimates and to said complex baseband signal samples for shifting the frequencies of said baseband signal samples by said frequency offset estimates to reduce the frequency offsets of said baseband signal samples to a minimum;
detector means comprising
means responsive to sid frequency shifted complex baseband signal samples for providing a plurality of signal samples which are time delayed relative to each other;
means responsive to a selected number of said time delayed signal samples for de-spreading and for demodulating each of said selected signal samples to provide a selected number of de-spread and demodulated signal samples; and
means for combining said selected number of de-spread and demodulated signal samples to provide a demodulated received output signal.

4,694,468
APPARATUS USEFUL IN CHANNEL EQUALIZATION ADJUSTMENT

Dennis F. Cullum, Leucadia, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 25, 1986, Ser. No. 855,562
Int. Cl.[4] H04B 17/00
U.S. Cl. 375—10 6 Claims



1. Apparatus for the measurement of the intersymbol interference of a digital output signal after transmission through a channel, wherein said intersymbol interference is related to the quality of equalization of said channel; said apparatus comprising:
a. means for applying an input digital signal to said channel at the approximate Nyquist rate of said channel,
b. means for receiving the output signal of said channel responsive to said input digital signal,
c. means for generating phased sampling signals relative to said output signal,

d. means for obtaining amplitude samples of said output signal by means of said sampling signals,

e. conversion means for producing corresponding pulse width samples from said amplitude samples, and

f. measurement means for determining the quantities of said pulse width samples having predetermined magnitudes of pulse widths,

whereby said quality of equalization of said channel is related to the dispersion of said samples over the range of said pulse width samples.

4,694,469

METHOD AND DEVICE FOR TIMING PULL-IN OF RECEIVING EQUIPMENT

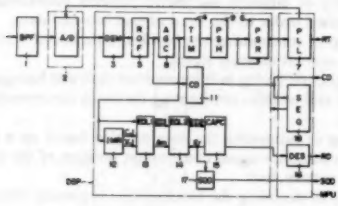
Takashi Kaku, Tama, and Yasuhiro Arai, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 4, 1986, Ser. No. 870,546

Claims priority, application Japan, Jun. 4, 1985, 60-120839; Jun. 7, 1985, 60-123772

Int. Cl.⁴ H04B *3/06, 3/10*

U.S. Cl. 375—13 **14 Claims**



1. A timing pull-in device of a receiving equipment comprising:

means for sampling a received signal from a transmission line by a certain sampling timing and demodulating the received signal;

means for extracting a timing signal from the demodulated signal;

means for phase-rotating the extracted timing signal by an amount of rotation phase previously set;

means for adjusting the sampling timing of the received signal by carrying out a phase-locked loop control on the basis of the phase-rotated timing signal;

means for recovering an impulse from the demodulated signal;

a first equalizing means for fix-equalizing the demodulated signal by using a tap coefficient previously set; and

a second equalizing means for automaticequalizing the equalized output of the first equalizing means to obtain an output signal;

wherein, at the time of an initial training of the receiving equipment, a training signal containing an impulse component is received from the transmitting line, the impulse is recovered from the training signal by the impulse recovering means, a complex conjugate of the recovered impulse is set to the first equalizing means as the tap coefficient for the fix-equalization, the tap coefficient for the automaticequalization is calculated from the recovered impulse to be initial-set to the second equalizing means, and the amount of the phase rotation is set to the phase rotating means so that the phase of the timing signal extracted by the extracting means coincides with the phase of an internal clock of the equipment.

4,694,470

DATA TRANSMISSION CIRCUIT

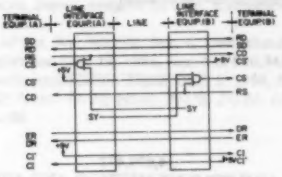
Toshimichi Shimatani, Fuchu, and Yoshihiro Kawata, Tokorozawa, both of Japan, assignors to Iwatsu Electric Co. Ltd., Tokyo, Japan

Filed Nov. 8, 1985, Ser. No. 796,554

Claims priority, application Japan, Nov. 14, 1984, 59-239696

Int. Cl.⁴ H04L *23/00*

U.S. Cl. 375—37 **2 Claims**



1. In a data transmission circuit accommodated in a transmission line of 64 Kbps channels through a multi-frame arrangement for transmitting data and control signals of a terminal equipment, the improvement in which a predetermined small number of frames of said multi-frame arrangement have assigned thereto a required number of bits, corresponding to data being transmitted, at least one synchronization flag bit and various control signals are assigned to the remaining bits but a request-to-send signal in the control signals is assigned to one of the remaining bits according to a logice OR of succeeding sampled values of the request to send signal, so that data of different transmission speeds can be transmitted by the same circuit, sampling means for effecting sampling of said succeeding sampled values of the request-to-send signal, and means for determining the value of the succeeding request-to-send signals prior to the sampling thereof.

4,694,471

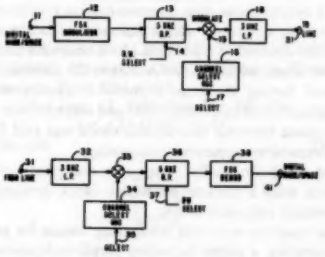
DIGITAL DATA COMMUNICATING

Barry A. Blesser, RFD 2, Box 335, Raymond, N.H. 03077

Filed May 5, 1986, Ser. No. 859,318

Int. Cl.⁴ H04L *27/10*

U.S. Cl. 375—45 **35 Claims**



1. Digital data communicating apparatus comprising,

a plurality of transmitting means for providing digital data signals each comprising,

modulating means for selectively providing first and second binary signals representative of first and second binary values, respectively,

bandpass filtering means for selectively transmitting signals within a predetermined bandwidth,

said bandpass filtering means including a bandwidth select terminal for receiving a bandwidth select signal for controlling said bandwidth,

a source of a local oscillator signal,

means for controlling the frequency of said local oscillator signal to select a desired audiofrequency channel,

output mixing means for combining the output of said bandpass filtering means with said local oscillator signal to provide a difference frequency signal modulated with said binary signals,

an output terminal,

and low-pass filtering means for coupling only said difference frequency signal to said output terminal for delivery to a communication channel.

4,694,472

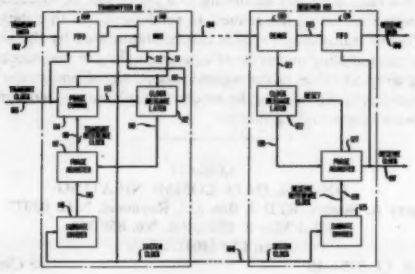
CLOCK ADJUSTMENT METHOD AND APPARATUS FOR SYNCHRONOUS DATA COMMUNICATIONS

Gabor P. Torok, Holmdel, N.J., and Andrew B. White, Urbana, Ill., assignors to American Telephone and Telegraph Company, New York, N.Y. and Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 371,661, Apr. 26, 1982, abandoned. This application Mar. 2, 1984, Ser. No. 585,456

Int. Cl.[4] H04L 7/00

U.S. Cl. 375—107 **18 Claims**



1. In a synchronous data communication system comprising a transmitter, a receiver and a common reference clock, said transmitter controlled by a first clock and said receiver controlled by a second clock derived from the common reference clock and having the same nominal frequency as said first clock, apparatus at said transmitter and said receiver for adjusting the phase between said second clock and said first clock, said transmitter apparatus comprising:

means for periodically comparing the phase of said first clock with a transmit reference clock derived from the common reference clock;

means responsive to said comparing means for periodically generating a phase adjusting signal independent of said second clock indicating a predetermined fixed increment phase adjustment of a fraction of one clock pulse of the common reference clock to be made between said common reference clock and said second clock at said receiver, said predetermined fixed increment phase adjustment being independent of the magnitude of the phase difference between said first clock and said transmit reference clock;

means for periodically transmitting said phase adjusting signal to said receiver; and

means for adjusting the phase between said first clock and said transmit reference clock by an amount equal to said predetermined fixed increment phase adjustment.

4,694,473

DATA COMMUNICATION SYSTEM WITH BLOCK SYNCHRONIZATION DATA IN MOBILE RADIO

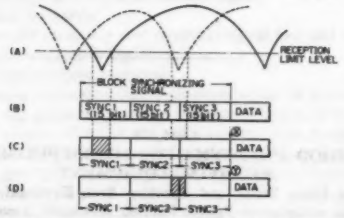
Hiroshi Etoh, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1986, Ser. No. 833,716

Claims priority, application Japan, Mar. 8, 1985, 60-44741

Int. Cl.[4] H04L 7/00

U.S. Cl. 375—116 **2 Claims**



1. A block synchronization data communication method in mobile radio comprising the steps of:

(1) a step of encoding data to be transmitted and blocking the encoded data,

(2) a step of adding a block synchronization signal having a plurality of different successive patterns positioned in a prescribed order to the head of said blocked data,

(3) a step of transmitting the blocked data added with said block synchronization signal,

(4) a step of receiving said transmitted data and recognizing one of said patterns constituting the block synchronization signal,

(5) a step of estimating the data position based on a block synchronization signal constitution position of the recognized pattern, and

(6) a step of decoding the blocked data beginning from said estimated position as received data.

4,694,474

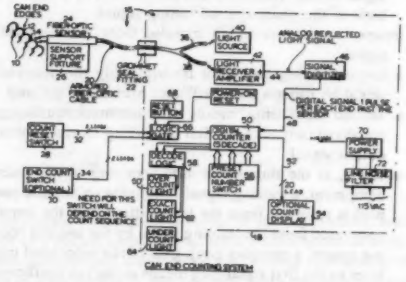
HIGH SPEED COUNTER FOR THIN OBJECTS

Richard A. Dorman, Troy, and Robert E. Johnson, Ballston Spa, both of N.Y., assignors to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jun. 18, 1986, Ser. No. 875,554

Int. Cl.[4] H03K 21/40; G06M 7/00

U.S. Cl. 377—6 **2 Claims**



1. A device for counting objects arranged in a stack which are differentiable by light reflectance, comprising:

a bifurcated fiber optic bundle having a transmitter arm and a receiver arm terminating in a bundle face for directing light toward said stack and for receiving corresponding reflected light from the stack;

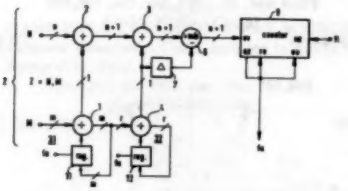
a light source coupled to said transmitter arm;
a light sensor coupled to said receiver arm for generating an electrical signal corresponding to light reflected by said stack; and
counting means for receiving said electrical signal and generating a count corresponding to the number of objects in the stock;
where said counting means comprises a digitizer circuit for generating a pulse corresponding to a peak value of said electrical signal and a digital counter for totalizing said pulse and wherein said electrical signal is characterized by alternating peaks and valleys corresponding to said objects, and said digitizer comprises peak detecting means and valley detecting means, said peak detecting means being disabled after a pulse is emitted until a valley is detected by the valley detecting means such that false counts are prevented.

4,694,475

FREQUENCY DIVIDER CIRCUIT

Soenke Mehrgardt, March, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed May 8, 1986, Ser. No. 861,152
Claims priority, application Euorpean Pat. Off., May 18, 1985, 85106137
Int. Cl.[4] H03K *21/02*
U.S. Cl. 377—48 **7 Claims**



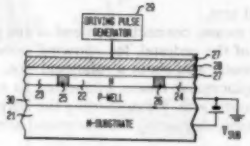
1. Frequency divider circuit for divisors consisting of an integral part and a fractional part which is designed in the manner of a rate multiplier and comprises:
a digital first accumulator including a clocked data register and an m-bit first adder having a first input presented with an m-bit first digital word corresponding to the fractional part of the divisor, and having a second input fed from the output of said data register, the input of said data register being connected to the output of said first adder said first accumulator having a sum output;
an n-bit second having a first input receiving an n-bit second digital word corresponding to the integral part of said divisor and having a second input connected to the carry output of said first adder;
an n+1 bit third adder having a first input coupled to the output of said second adder, said third adder having a second input and an output;
a subtracter having its minuend input coupled to the output of said third adder output, said subtracter having a subtrahend input and an output;
a presettable counter having its preset input coupled to the output of said subtracter output, and having a count input receiving a signal to be frequency divided;
said counter having a counter output at which a pulse occurs after a number of pulses equal to the value applied to said preset input, output pulses at said counter output being the frequency-divided signal;
said frequency divided signal clocking said data register, and;
an r-bit second accumulator, wherein $1 \leqq r \leqq m$, having an input receiving the r most significant output bits of said first accumulator sum output, and having a carry output coupled to a second input of said third adder and coupled to the subtrahend input of said subtracter; and
a delay means disposed between said second accumulator carry output and said subtracter subtrahend input, said delay means having a delay equal to the period of said frequency divided signal.

4,694,476

BURIED CHANNEL CHARGE COUPLED DEVICE

Eiji Oda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 741,942, Jun. 6, 1985, abandoned. This application Sep. 19, 1986, Ser. No. 910,343
Claims priority, application Japan, Jun. 6, 1984, 59-116073
Int. Cl.[4] G11C *19/28*; H01L *29/78, 27/14, 31/00*
U.S. Cl. 377—58 **7 Claims**



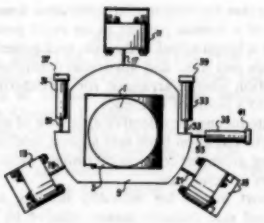
1. A buried channel charge coupled device (CCD) wherein buried CCD elements are disposed on a semiconductor substrate having one conductivity and disposed in a semiconductor area having a conductivity reverse to that of said semiconductor substrate; transfer electrodes disposed in said CCD for receiving three-level driving pulses wherein the pulses are applied to each of said electrodes, each pulse has, at different time points, first, second and third voltage levels, and the first voltage level is applied to selected ones of the transfer electrodes with the second voltage level applied to selected other ones of the transfer electrodes during at least one part of a time period in a charge transfer period and a charge integration period so that part of signal charges in the buried channel are drained through said semiconductor area into said semiconductor substrate, and said second and third voltage levels are alternately applied to said transfer electrodes during the charge transfer period.

4,694,477

FLEXURE STAGE ALIGNMENT APPARATUS

Graham J. Siddall, Woodside, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 21, 1983, Ser. No. 564,434
Int. Cl.[4] G05G *11/00*
U.S. Cl. 378—34 **21 Claims**



12. An alignement apparatus for movably supporting an X-ray lithography mask, the apparatus comprising:
a stage plate for holding the mask in an X-Y plane;
first displacement means, attached to the stage plate and disposed along a radial axis of the stage plate in an X-Y

plane, the first displacement means being operative for linearly translating the stage plate along the radial axis;

second and third displacement means, attached to the stage plate and disposed in the X-Y plane orthogonally to the radial axis, for displacing the stage plate;

first, second and third flexure assemblies, attached to the stage plate at first, second and third points distributed equiangularly about the perimeter of the stage plate, the flexure assemblies each being operative for supporting the stage plate and for displacing the stage plate along a Z-axis orthogonal to the X-Y plane;

said displacement means each including an elastic element attached to the stage plate, each elastic element being stiff in a longitudinal axis and flexible orthogonally to the longitudinal axis and a piezoelectric transducer;

said first, second and third displacement means each being anchored to first, second and third fixed blocks;

said first flexure assembly including;

a pedestal,

a horizontal arm,

attachment means, connecting an end of the horizontal arm to a top of the pedestal, for allowing smooth rotation of the horizontal arm about a rotational axis,

vertical displacement means, connected to an underside of the horizontal arm, for supporting the horizontal arm and for selectably displacing the horizontal arm in the Z-axis,

a rigid bar,

vertical flexure means, connected between the rigid bar and another end of the horizontal arm, for allowing movement of the rigid bar in an X-axis.

4,694,478

APPARATUS FOR ORTHORADIAL PANORAMIC TOMOGRAPHY

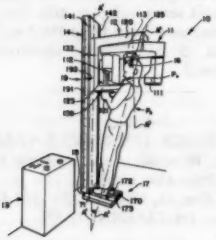
Hanspeter Delnon, Seestrasse 24, 8712 Stäfa, Switzerland

Filed Dec. 23, 1985, Ser. No. 812,286

Claims priority, application Switzerland, Jan. 25, 1985, 347/85

Int. Cl.[4] H05G *1/60*; G03B *23/04*; A61B *6/04*

U.S. Cl. 378—39 **16 Claims**



1. An apparatus for orthoradial panoramic tomography of a head region of a human patient in an erect position defined essentially by a longitudinal body axis, said patient having feet including heels and toes; said apparatus comprising:

(a) a radiation source arranged for predetermined motion relative to a point of reference;

(b) a cassette means for selective exposure of an X-ray sensitive film to radiation from said source, said cassette means also being arranged for predetermined motion relative to said point of reference;

(c) a support means for movably holding said radiation source and said cassette means relative to said point of reference;

(d) a head positioning means including an intraoral device and an extraoral device for positioning said patient's head relative to said point of reference;

(e) a carriage means connected with said support means and including a grip means;

(f) a substantially vertical column means for slidingly holding said carriage means in a vertically defined position and having a vertical axis distracted from said point of reference;

(g) a foot positioning means having a substantially horizontal reference face for defining a vertical distance from said horizontal reference face to said point of reference, and a substantially vertical reference face for maintaining toe and/or heel portions of said patient's feet in a predetermined position;

(h) a distancing means for maintaining said at least one vertical reference face at a reproducible horizontal distance from said vertical axis of said column means;

(i) a means for determining and reproducibly setting a vertical distance between said horizontal reference face and said point of reference;

said positioning means being arranged relative to said point of reference and to said vertical column axis for maintaining said patient, when standing on said foot positioning means and engaging said grip means, in a reproducible and inclined position in which his or her longitudinal body axis relative to said vertical column axis is at an angle (α) sufficient to cause an isotonic strain of brachial and dorsal muscles.

4,694,479

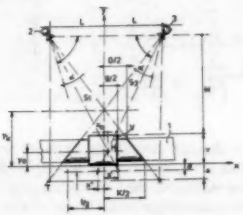
VIDEO-RADIOGRAPHIC PROCESS AND EQUIPMENT FOR A QUALITY CONTROLLED WELD SEAM

Endre Bácskai; Ferenc Rétfalvi, and András Sásdi, all of Budapest, Hungary, assignors to Kohaszati Cyaropito Vallalat Gepipari Technologiai Intezet, Budapest, Hungary

Filed Apr. 29, 1985, Ser. No. 728,499

Int. Cl.[4] G01N *23/02*

U.S. Cl. 378—58 **3 Claims**



1. Video-radiographic process for the quality control of welds, wherein a weld seam is transilluminated, successively point by point, with X-ray or gamma ray, to produce electrical signals which represent a radiographic image of the weld and its environment; the image being stored for the display and used in the evaluation of a weld, wherein there are included the following improved steps:

(a) providing at least a pair of radiation sources of identical intensity, each directed toward the same portion of a new weld seam (V) at an angle, to transilluminate a portion of the weld area;

(b) positioning sources in a plane on the one side of the surface of weld seam (V), the plane being perpendicular with respect to a vertical axis (Y) and parallel with respect to both a transverse axis (X) and a longitudinal axis (Z), the (Z) axis extending along the length of the weld (V), the sources symmetrically disposed about the vertical axis (Y);

(c) positioning a target plate of a video camera in a plane disposed perpendicular to the vertical axis (Y), parallel to both the longitudinal axis (Z) and the transverse axis (X) on the other side of the surface of the weld seam to be irradiated, so that both radiation sources lie in a common plane spaced from and parallel to the plane of the target plate and separated by the weld seam (V);

(d) transilluminating the portion of the weld seam with the

first radiation source operating in a pulsed mode to form a first radiographic still picture;

(e) converting the first radiographic still picture into electrical signals, noting the first picture's position along the seam, and storing the first picture and its position as a first image;

(f) transilluminating the same portion of the weld seam with the second radiation source operating in a pulsed mode to form a second radiographic still picture, noting the second picture's position along the seam, and storing the second picture and its position as a second image;

(g) repeating steps (a) through (f) along the entire length of the weld;

(h) forming a reference standard image using the above-mentioned steps (a) through (f) on a known flawless weld seam having the same characteristics and environment as the new weld; and

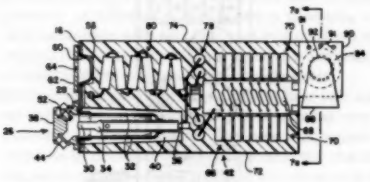
(i) comparing each of the first and second images of the new weld with corresponding images of the previously obtained reference standard, obtained from the flawless weld having the same characteristics, to grade and determine the quality of the weld by comparison with the reference standard and to determine the position of any defects.

4,694,480

HAND HELD PRECISION X-RAY SOURCE

Brian Skillicorn, Sunnyvale, Calif., assignor to Kevex Corporation, Foster City, Calif.

Filed Jul. 30, 1985, Ser. No. 760,684
Int. Cl.⁴ H05G 1/06
U.S. Cl. 378—119 **19 Claims**



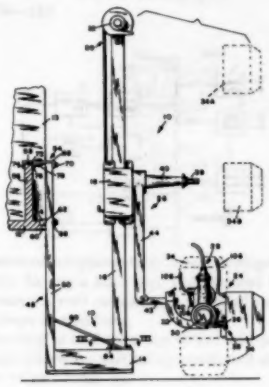
18. An elongated molded block including an x-ray source and integral generator, the block having a cross-sectional geometry which provides for two enlarged cylindrical portions aligned with the longitudinal axis of the block and joined by a thinned, flat central portion, the block having three longitudinal regions aligned in tandem, a first region at one end of the block defining a first heat conduction fluid fillable longitudinally extending cavity opening at a first end wall of the block for receiving an elongated x-ray tube and for providing a high voltage connection to an anode target connection of the x-ray tube adjacent to an interior end enclosed by the block the block having a second region adjacent the first region for encapsulating the capacitors and diodes of a single high voltage multiplier stack wherein voltage multiplying capacitors are embedded in the cylindrical portions of the second region of the block and voltage multiplying diodes are embedded in the thinned flat central portion lying between the cylindrical portions, and the block having a third region adjacent the second region containing and encapsulating primary and secondary windings of a single high voltage switching transformer means including a ferrite magnetic core for generating a high voltage and having internal connections of the secondary to the voltage multiplier stack and external primary leads.

4,694,481

TRANSPORTABLE X-RAY APPARATUS

Robert J. Tashjian, West Boylston, and Charles E. Moreland, Wakefield, both of Mass., assignors to New England Institute of Comparative Medicine, West Boylston, Mass.

Filed Aug. 15, 1985, Ser. No. 766,132
Int. Cl.⁴ H05G 1/02
U.S. Cl. 378—198 **13 Claims**



1. Transportable X-ray apparatus which is adapted to be transported in a motor vehicle and to be mounted externally on the transport vehicle, said transportable X-ray apparatus comprising:

(a) a support assembly which includes a horizontal support base and an elongated vertical mast,

(b) a carriage which is mounted on the mast for sliding vertical movement,

(c) a radiation assembly which includes a collimator and a tube unit assembly which is operatively connected to the collimator,

(d) first mounting means for supporting said radiation assembly on said carriage for vertical movement with the carriage, and

(e) second mounting means for supporting said support assembly on the transport vehicle so that the transportable X-ray apparatus extends externally of the transport vehicle, said second mounting means comprising:

(1) a vertical bracket which is fixed to said horizontal support base and which has a free top end,

(2) an anchoring fixture at one end of the vehicle, and

(3) an attaching fixture which is fixed to said vertical bracket for operatively engaging said anchoring fixture so that the entire transportable X-ray apparatus is suspended from said anchoring fixture.

4,694,482

DIGITAL TONE DETECTOR

Gordon J. Reesor, Nepean; Patrick R. Beirne, and Zbigniew B. Styrna, both of Kanata, all of Canada, assignors to Mitel Corporation, Ontario, Canada

Division of Ser. No. 705,679, Feb. 26, 1985. This application Oct. 22, 1986, Ser. No. 921,526
Claims priority, application Canada, Nov. 9, 1984, 467548
Int. Cl.⁴ H04M 1/24
U.S. Cl. 379—27 **2 Claims**

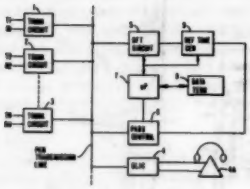
1. A method for performing line circuit diagnostics on one or more line circuits, comprising the steps of:

(a) generating and transmitting a digital sample sequence of a test tone signal having predetermined frequency to a line circuit of a PABX,

(b) receiving a modified version of said sample sequence from said line circuit,

(c) generating one or more further digital sample sequences of tone signals having frequencies harmonically related to said predetermined frequency, and

(d) performing a discrete Fourier transforms on said received sample sequence with respect to said further digital sample sequences and generating one or more digital cross



correlation signals for transmission to the PABX having magnitude parameters which are proportional to the amounts of energy in the received signal at said harmonically related frequencies,

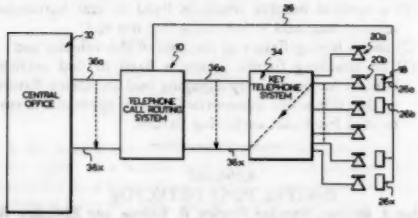
whereby said magnitudes of the correlation signals provide an indication of the status of internal circuitry of said one or more line circuits.

4,694,483

COMPUTERIZED SYSTEM FOR ROUTING INCOMING TELEPHONE CALLS TO A PLURALITY OF AGENT POSITIONS

Edward H. Cheung, Mississauga, Canada, assignor to Innings Telecom Inc., Ontario, Canada

Filed Jun. 2, 1986, Ser. No. 869,408
Int. Cl.[4] H04M *3/22*
U.S. Cl. 379—34 **13 Claims**



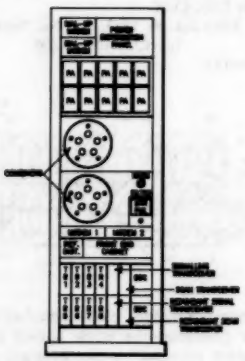
1. A telephone call routing system for routing incoming telephone calls by assigning each such incoming call to a selected one of a plurality of agent display modules, said system comprising means for receiving said incoming telephone call, means for assigning said incoming telephone call to one or more of said agent display modules, each of said agent display modules being in electronic communication with said incoming call assigning means, said agent display module having a visual output indicating which of a plurality of telephone lines carrying said incoming call is assigned thereto, a plurality of agents' telephones, each telephone being associated with a corresponding one of said agents' modules, means for connecting each of said telephones to said line carrying said incoming call, said telephone having means for generating and transmitting a coded signal along said telephone line carrying said incoming call when any one of said telephones is actuated to answer said incoming call, said signal being uniquely coded to identify said agent's module which is associated with said telephone which answers said incoming call, signal detection means to detect said transmitted coded signal and to decode said coded signal and determine which telephone associated with an agent's module answered said incoming call, means for monitoring agent telephone activity by determining and storing a characteristic representative of activity of each agent's telephone, means for accessing said monitor means and determining activity of each telephone answering incoming calls, said accessing means being in communication with said assigning means, said assigning means assigning the next incoming call to the selected agent's module associated with the least actively used telephone providing there are at least two inactive telephones at the time of assigning the next incoming call.

4,694,484

CELLULAR RADIOTELEPHONE LAND STATION

Frederick G. Atkinson, Winfield; Anthony Kobrinetz, Hoffman Estates, and Barry J. Menich, Chicago, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 18, 1986, Ser. No. 830,145
Int. Cl.[4] H04Q *7/04*
U.S. Cl. 379—59 **19 Claims**



1. A modular multichannel fixed site station for radiotelephone communications, comprising:

a common equipment housing having a plurality of apertures wherein electrical equipment modules may be disposed, each aperture having electrical connections to a fixed site station controller and providing an electrical interconnection having one of at least two characteristics with a module disposed therein;

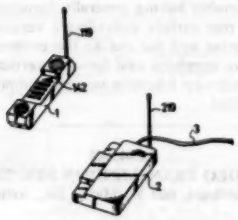
a plurality of radio transceiver modules, having variable receive and transmit parameters, removably disposed in first and second electrical interconnection characteristic apertures;

means, disposed in said fixed site station controller, for programming said variable receive and transmit parameters of each said plurality of radio transceiver modules to predetermined parameters unique to each said transceiver module and dependent, inter alia, upon whether each transceiver module is disposed in said first or second electrical interconnection characteristic aperture.

4,694,485
CORDLESS TELEPHONE

Sumio Iwase, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 596,947, Apr. 5, 1984, abandoned. This application Sep. 25, 1986, Ser. No. 912,185
Claims priority, application Japan, Apr. 7, 1983, 58-61301
Int. Cl.[4] H04M 11/00
U.S. Cl. 379—62 19 Claims



1. A cordless telephone system, comprising:

a base unit having a transmitter-receiver unit including a plurality of different communication channels and being connected to a telephone network;

a handset having a receiver-transmitter unit including said plurality of different communication channels, whereby communication with said base unit is carried out by transmitting and receiving radio waves over a first selected one of said plurality of communication channels;

detecting means provided in one of said base unit and handset for detecting whether said first selected one of said plurality of communication channels is occupied and, in response to occupation of said first selected channel, producing a channel-occupied signal and switching to a vacant channel;

selecting means provided in the other of said base unit and handset for selecting said vacant channel in response to said channel-occupied signal, so that said vacant channel is seized;

said selecting means including first channel selector means connected in said base unit and second channel selector means connected in said handset;

said detecting means including a first signal detector connected to said base unit and means for producing a channel identification signal fed to said first channel selector means for selecting a channel in response thereto, and said base unit including means for transmitting said channel identification signal to said second channel selector means for selecting said channel in said handset in response thereto;

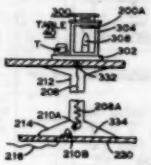
said selecting means further including computing means for computing said vacant channel based on the next sequential one of said plurality, and

further including a phase-locked-loop circuit having a variable frequency dividing circuit in which the frequency dividing ratio is responsive to said computing means for changing said first and second channel selector means to said vacant channel.

4,694,486
COMBINED TELEPHONE-TABLE SYSTEM

Seymour C. Yuter, 407 Cedar Drive West, Briarcliff Manor, N.Y. 10510

Division of Ser. No. 332,477, Dec. 21, 1981, which is a division of Ser. No. 173,037, Jul. 28, 1980, which is a continuation of Ser. No. 13,568, Feb. 21, 1979. This application Apr. 10, 1984, Ser. No. 580,827
Int. Cl.[4] H04M 1/15
U.S. Cl. 379—110 6 Claims



1. A combined telephone-table system comprising:

(A) a table having a table top, pedestal and base, said base comprising a wall enclosing a space of substantially the same shape as said base;

(B) an opening in said table top above said pedestal;

(C) a single telephone unit solely positioned above the upper surface of said table top;

(D) a first cable having a movable socket;

(E) a second cable passing from said telephone unit through said opening and pedestal and terminating in said space enclosed by said wall of said base;

(F) a movable plug attached to the end of said second cable;

(G) retracting means associated with said second cable whereby said second cable when stretched will retract to substantially its original length when released;

(H) said second cable and movable plug having a combined length which is sufficient when stretched for said movable plug to extend past the periphery of said base, and when released for said movable plug to retract past the periphery of said base into said space enclosed by said wall of said base;

(I) whereby when said movable plug of said second cable is stretched past the periphery of said base and plugged into said movable socket of said first cable, said connected movable plug and movable socket will retract past the periphery of said base into said space enclosed by said wall of said base when said second cable is released.

4,694,487
CONTROLLING MULTI-FORT HUNT GROUPS IN A DISTRIBUTED CONTROL SWITCHING SYSTEM

Shih-Jeh Chang, Naperville; Richard T. Emery, Montgomery; Shafik J. Hakim, and Douglas S. Sand, both of Naperville, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 7, 1985, Ser. No. 699,462
Int. Cl.[4] H04Q 3/42
U.S. Cl. 379—269 21 Claims

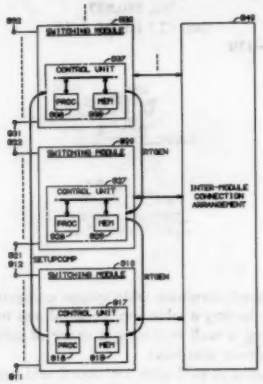
1. In a distributed call processing system for use in a switching system interconnecting a plurality of ports including a plurality of multi-port hunt groups, said call processing system comprising a plurality of control units each associated with a subset of said plurality of ports and each storing reference data defining, for each of said hunt groups, one of said control units that is designated as the controller for said each hunt group, and storing hunt data defining the busy/idle status of the ports of each of said hunt groups for which said each control unit is designated as the controller,

a method of processing a call to a given one of said hunt groups comprising

a first one of said control units accessing its reference data in

response to said call and determining that a second one of said control units is designated as the controller for said given hunt group,

said first control unit transmitting a message to said second control unit defining said given hunt group and



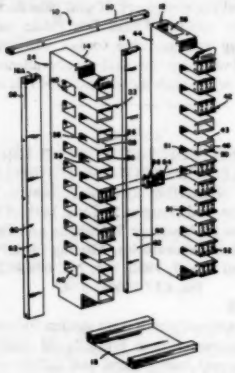
said second control unit accessing its hunt data and assigning to receive said call, one port of said given hunt group that is idle.

4,694,488

DISTRIBUTING FRAME FOR TELECOMMUNICATIONS CIRCUITS

Nils P. Mickelson, Gorham, Me., and Jerauld C. MacFarlane, Hurst, Tex., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 15, 1986, Ser. No. 906,878
Int. Cl.[4] H05K *7/18*
U.S. Cl. 379—327 **9 Claims**



9. A modular distributing frame assembly for distributing telephone circuits comprising:

a central office bay member comprising a generally vertical hollow member having generally forward and rear surfaces, said forward surface having a plurality of alternating openings and interstices, each said opening communicating with said rear surface and having a terminal block mounted therein to provide appearances for office cables; said rear surface defining a vertical opening communicating with said forward openings and adapted to receive said office cables;

an outside plant bay member comprising a generally vertical hollow member having generally forward and rear surfaces, said forward surface having a plurality of openings communicating with said rear surface, each of said openings having a terminal block mounted therein to provide appearances for subscriber cables, said rear surface defining a vertical of opening, having connector blocks mounted therein, each said connector block being electrically associated with an adjacent terminal block; said interstices of said central office and outside plant bay member forming a horizontal pathway whereby jumper connections may be formed; and

a vertical trough member comprising a generally vertical partition member having generally forward and rear surfaces, said rear surface providing a vertical channel for cables to enter and fan out to the connector blocks of adjacent bay members, said forward vertical surface providing a pathway whereby vertical jumper connections may be routed.

4,694,489

VIDEO TRANSMISSION SYSTEM

Jeffrey E. Frederiksen, 603 W. Haven Dr., Arlington Heights, Ill. 60005

Division of Ser. No. 564,405, Dec. 22, 1983. This application Jul. 10, 1986, Ser. No. 884,213
Int. Cl.[4] H04N *7/167*
U.S. Cl. 380—10 **2 Claims**

1. In a video transmission system providing secure transmission of a video signal over a communications channel for reception by designated customers, synchronization information indicating the starting positions of video lines and customer data for designating individual customers permitted to receive the video signal,

a decoder having means for detecting the synchronization information and thereupon generating horizontal sync pulses indicating the starting positions of the video lines, wherein the improvement comprises,

at least a portion of the customer data for a particular customer is transmitted in a preassigned time slot in a video line including a record number preassigned to the particular customer, and

the decoder has a customer memory programmed with a customer identification number including a programmed customer record number and a programmed customer time slot identifier, and means for latching the customer data from a video line having a record number matching the programmed customer record number, the customer data being latched from the video line at a time slot indicated by the programmed customer time slot identifier.

4,694,490

SIGNAL PROCESSING APPARATUS AND METHODS

John C. Harvey, 333 E. 57th St., New York, N.Y. 10022, and James W. Cuddihy, 523 E. 14th St., New York, N.Y. 10009

Filed Nov. 3, 1981, Ser. No. 317,510
Int. Cl.[4] H04K *9/00*; H04N *7/08*
U.S. Cl. 380—20 **13 Claims**

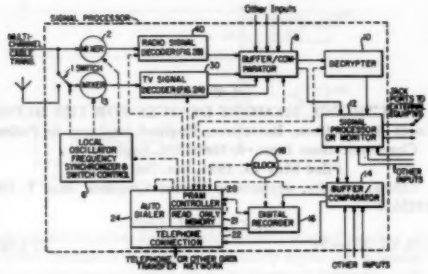
1. A method of communicating television program material to a multiplicity of receiver stations each of which includes a television receiver and computer, the computers being adapted to generate and transmit overlay signals to their associated television receivers, said overlay signals causing the display of user specific information related to said program material, and with at least some of said computers being programmed to

process overlay modification control signals so as to modify the overlay signals transmitted to their associated receivers, each of said computers being programmed to accommodate a specific user application, comprising the steps of:

transmitting a video signal containing a television program signal to said receivers,

transmitting an instruct-to-overlay signal to said receiver stations at a time when the corresponding overlay is not being displayed,

receiving said video signal at a plurality of receiver stations and displaying said program material on the video receivers of selected ones of said plurality of receiver stations,



detecting the presence of said instruct-to-overlay signal at said selected receiver stations and coupling said instruct-to-overlay signal to the computers associated with the video receivers of said selected stations, and

causing said last named computers to generate and transmit their overlay signals to their associated television receivers in response to said instruct-to-overlay signal, thereby to present a display at the selected receiver stations including the television program material and the related computer generated overlay, the overlays displayed at a multiplicity of said receiver stations being different, with each display specific to a specific user.

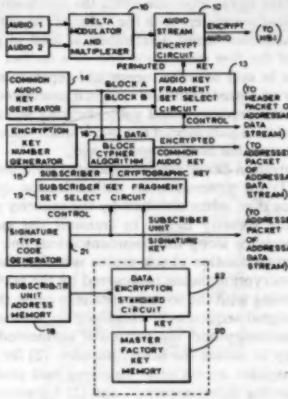
4,694,491

CRYPTOGRAPHIC SYSTEM USING INTERCHANGEABLE KEY BLOCKS AND SELECTABLE KEY FRAGMENTS

Donald R. Horne, Don Mills, and John M. Jeffers, Downsview, both of Canada, assignors to General Instrument Corp., New York, N.Y.

Filed Mar. 11, 1985, Ser. No. 710,385
Int. Cl.[4] H04N *7/167, 7/00, 7/10*
U.S. Cl. 380—20 **31 Claims**

1. A cryptographic system for the secured transmission of information between first and second nodes, comprising, at the first node; means for generating a key comprising more than one key fragment; means for selecting a set of one or more of the key fragments; means for generating data indicative of the selected key fragments; means for encrypting the information using the selected key fragment set; means for encrypting the key, said key encrypting means comprising means for generating a second key comprising more than one second key fragment; means for selecting a set of one or more of the second key fragments; means for encrytping said key with said selected set of second key fragments, means for generating second data indicative of the set of second key fragments selected; and means for transferring the encrypted information, encrypted key, select data and second data from the first node to the second node; and at the second node, means for decrypting the encrypted key, means for obtaining the selected key fragments set from the decrypted key in accordance with the



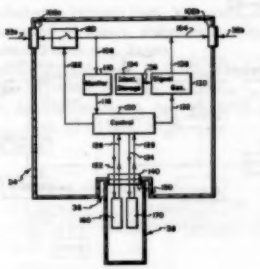
transferred select data and means for decrypting the encrypted information using the obtained key fragments set.

4,694,492

COMPUTER COMMUNICATIONS SECURITY CONTROL SYSTEM

Peter Wirstrom, Pepper Pike, Ohio, and William H. Cork, Lake Bluff, Ill., assignors to Pirmasafe, Inc., Cleveland, Ohio

Filed Nov. 9, 1984, Ser. No. 670,471
Int. Cl.[4] H04L *9/00*
U.S. Cl. 380—23 **28 Claims**



1. Apparatus for verifying the authorization of a user of a terminal for accessing a host computer through a communications link, the apparatus comprising:

(a) encryption means for being carried by an "authorized user," namely a person who is authorized to use terminal to access a host computer through a communications link that connects the terminal to the host computer, the encryption means including a first encryption that has a value which has been assigned to the authorized user as an indicator of the authorized user's authority to access the host computer and also including a second variable encryption representative of the time of a prior successful authorized access with the host computer;

(b) security means interposed in series between portions of the communications link for monitoring signals as they are transmitted along the communications link, the security means defining port means for receiving the encryption means and for cooperating with the encryption means (1) to detect a predetermined authentication query signal

sequence of monitored signals as the authetication query signal sequence is transmitted along the communications link from the host computer and, (2) in response to such detection, to effect transmission of a predetermined autheticating signal sequence along the communications link to the host computer, with the value of the authenticating signal sequence being determined at least in part by the value of the first encryption and of a further encryption resident in said security means and representative of the identity of a predetermined terminal associated therewith so that the predetermined authenticating signal sequence constitutes an indicator of the user's and terminal's authority to access the host computer; and,

(c) authorization check means associated with the host computer (1) for generating an authentication query signal sequence that, when detected by the security means, will cause the security means to transmit the autheticating signal sequnce along the communications link to indicate to the authorization check means whether the autorized user's encryption means is received by the port means for cooperating with the security means to cause the authenticating signal sequence to constitute an indication of the user's authority and the particular connected terminal's authority to access the host computer, (2) for permitting host computer access upon receiving said predetermined autheticating signal sequence, and (3) for preventing host computer access upon receiving an autheticating signal sequence that is other than said predetermined autheticating signal sequence.

4,694,493

SPEAKER VERIFICATION SYSTEM

Hiroaki Sakoe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

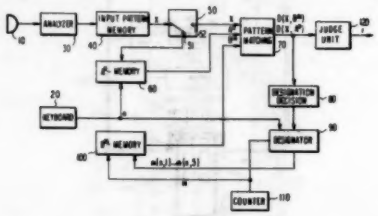
Filed Mar. 20, 1984, Ser. No. 591,652

Claims priority, application Japan, Mar. 30, 1983, 58-54132

The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.

Int. Cl.[4] G10L *5/00*

U.S. Cl. 381—42 **9 Claims**



1. A speaker verification system comprising:

a first memory for storing, as control reference patterns, patterns which are obtained by speaking a predetermined password under a plurality of predetermined conditions;

a second memory for storing, as a verification reference pattern corresponding to a registered speaker, a pattern which is obtained by said registered speaker speaking said password;

first means operating in response to outputs of said first and second memories for selecting control reference patterns from said first memory consecutively, said selected patterns being those that are the most similar to the verification reference pattern corresponding to said registered speaker;

second means operating in response to outputs of said first memory, said second memory, and said first means for determining, during verification, a first dissimilarity between the input pattern obtained by the speech of a person being verified and the verification reference pattern corresponding to said registered speaker, and second dissimilarities between said input pattern and the selected control reference patterns; and

third means operating in response to an output of said second means for outputting a confirmation signal when said first dissimilarity is less than all said second dissimilarities and a predetermined threshold value.

4,694,494

ELECTRONIC MEMORY DEVICES FOR THE BLIND

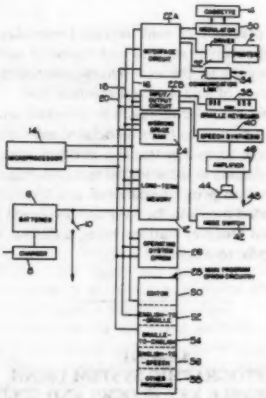
Louis A. Woolfson, Bartestree, England, assignor to Pathway Communications Limited, Hereford, England

Filed May 15, 1984, Ser. No. 610,565

Claims priority, application United Kingdom, Jun. 7, 1983, 8315630

Int. Cl.[4] G10L *5/00*

U.S. Cl. 381—51 **12 Claims**



1. An electronic memory device for a blind person or person having impaired vision, said device comprising: a Braille keyboard having a respective key for inputting each dot of a Braille character; memory means for storing in coded form text which has been entered on the keyboard in Braille notation; text transfer means for transferring text from the keyboard to the memory means; text editing means controllable by way of the keyboard to enable text which has been entered on the keyboard and stored in the memory means to be edited by searching for a specified portion of text, by deleting characters from the text and by inserting characters into the text and to enable the edited text to be restored in the memory means; a speech synthesizer for outputting speech in response to receipt of speech codes, and speech control means controllable by way of the keyboard for translating text from the memory means into speech codes and supplying said speech codes to the speech synthesizer, whereby text which has been entered on the keyboard and stored in the memory means may be interactively edited by a user by means of the text editing means in response to reproduction by the speech synthesizer of the text selected for editing by the text editing means.

4,694,495

INTEGRABLE CIRCUIT FOR IDENTIFYING A PILOT TONE

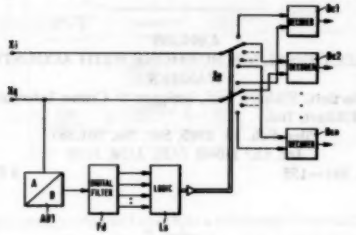
Bernhard Schroeer, Emmendingen, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Feb. 20, 1986, Ser. No. 831,974

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1985, 3505950

Int. Cl.[4] H04H 5/00

U.S. Cl. 381—15 11 Claims



1. A circuit for identifying a pilot from a limited number of pilot tones contained in an audio frequency signal and wherein each said pilot tone corresponds to preassigned functions, said circuit comprising:

an analog-to-digital converter receiving said audio frequency signal;

a subsampling digital averager;

a digital-tone-range filter coupling the output of said analog-to-digital converter to the input of said subsampling digital averager;

a plurality of digital pilot tone filters each having its input coupled to the output of said averager and each providing an output when a corresponding one of said pilot tones occurs;

a plurality of absolute value stages each having its input coupled to the output of a corresponding one of said digital pilot tone filters;

a plurality of low pass filters each having its input coupled to the output of a corresponding one of said absolute value stages; and

circuit means responsive to the outputs of said plurality of low pass filters for selectively enabling the performance of the functions assigned to said pilot tones.

4,694,496

CIRCUIT FOR ELECTRONIC SPEECH SYNTHESIS

Hans Brandl, and Werner Liegl, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 4, 1983, Ser. No. 491,581

Claims priority, application Fed. Rep. of Germany, May 18, 1982, 3218755

Int. Cl.[4] G10L 5/00

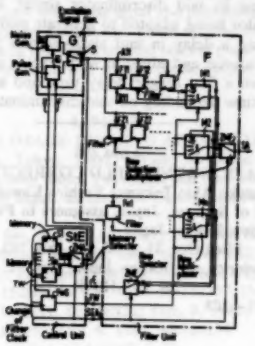
U.S. Cl. 381—51 13 Claims

1. In a circuit for electronic speech synthesis having a means for sampling speech elements and representing said speech elements by a plurality of significant parameters, an excitation signal generating means for generating a pulse excitation signal based on a portion of said significant parameters for representing voiced sounds and for generating a noise signal for representing voiceless sounds, a means for combining a plurality of speech elements into longer speech segments, and an electro-acoustical transducer, the improvement comprising:

a filter unit connected to said excitation signal generating means and to said transducer having a plurality of individual filters each having a fixed filter coefficient, said filter unit generating an electrical speech signal which is supplied to said transducer for conversion into an audio speech signal, said individual filters being arranged in a matrix having rows and columns and each row of said individual filters constituting a filter group; and

control means connected to said excitation signal generating means and to said filter unit for selectively driving only those individual filters in said filter unit needed for representing a remainder of said plurality of significant parameters of said speech elements, the individual filters in a selected matrix row being supplied in parallel with said excitation signals from said excitation signal generating means to a matrix output; and

means for sequentially connecting the outputs of the individual filters in said selected matrix row to said matrix output.



4,694,497

AUTOMOTIVE MULTI-SPEAKER AUDIO SYSTEM WITH AUTOMATIC ECHO-CONTROL FEATURE

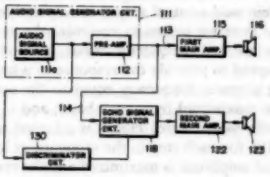
Junichi Kasai, Yokohama; Hiroshi Imai, Yokosuka, and Hiroshi Tsuda, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Division of Ser. No. 796,974, Nov. 12, 1985. This application Mar. 27, 1986, Ser. No. 844,680

Claims priority, application Japan, Apr. 20, 1985, 60-85222

Int. Cl.[4] H03G 3/00

U.S. Cl. 381—63 10 Claims



1. An automotive audio system comprising:

an audio signal source adapted to generate audio signals for reproduction;

a first audio signal path for feeding said audio signals from said audio source to a first speaker adapted to generate a first audio sound by reproducing said audio signals;

a second audio signal path for feeding said audio signals from said audio signal source to a second speaker independent of said first speaker and adapted to generate a second audio sound;

a sound discriminator receiving said audio signal and discriminating between non-musical sound and musical sound for producing a discriminator signal indicative thereof; and

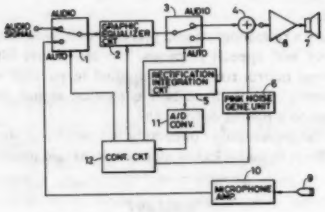
an echo signal generator interposed within said second audio signal path for receiving said audio signals from said audio signal source and generating echo signals to be reproduced through said second speaker, said echo signal generator being associated with said sound discriminator and adjusting its operating level between a predetermined minimum level and a predetermined maximum level in response to said discriminator signal, said echo signal generator being adapted to generate said echo signals by inducing a delay in said audio signals from said audio signal source, and adjusting said delay in said audio signals between a first longer delay time and a second shorter delay time depending on said discriminator signal.

4,694,498

AUTOMATIC SOUND FIELD CORRECTING SYSTEM

Shinichi Suzuki; Akio Tokumo; Yoshiro Kunugi, and Masayuki Kato, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 31, 1985, Ser. No. 793,417
Claims priority, application Japan, Oct. 31, 1984, 59-229987
Int. Cl.[4] H04R *3/04*
U.S. Cl. 381—103 **5 Claims**



1. A circuit for adjusting the frequency characteristics of a graphic equalizer that is adjustable in amplitude for each of a plurality of frequency bands, said circuit comprising:

test signal generating means adapted to provide an input to said equalizer,

detector means adapted to detect the output of said equalizer, and

control means adapted to adjust the amplitude of a plurality of combinations of said equalizer frequency bands to generate a composite frequency characteristic;

wherein said control means is responsive to the output of said detector means to maximize the amplitude of at least one of said frequency bands, whereby said circuit is adapted to provide the response of a band-pass filter having a center frequency equal to the center frequency of said maximized frequency band; and

wherein said control means is adapted to operate sequentially, for each step in the sequence at least one frequency band amplitude is maximized and the remaining frequency band amplitudes are minimized, and said control means stores the output from the output from the detector means and generates a composite control signal that optimally adjusts the amplitude of each equalizer frequency band whereby said circuit is adapted to provide the response of a series of band-pass filters, each having a center frequency which is equal to the center frequency of a respective frequency band.

3. An automatic sound field correction system for connection between a source of audio signal at an input and audio speaker means at an output, said system comprising:

equalizer means having a plurality of adjustable frequency bands;

test signal generation means;

transducer means adapted to receive the sound from said audio speaker means;

digital conversion means, said means adapted to convert an output of said equalizer means into a digital signal;

switch means adapted in a first mode to connect said equalizer means between said source and said audio speaker means and in a second mode to disconnect said equalizer means from said source and said audio speaker means and to connect said equalizer means between said transducer means and said digital conversion means; and

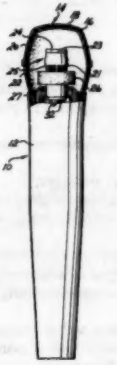
control means connected to said equalizer means and adapted to selectively adjust the amplitude of the frequency bands of said equalizer means in a sequence of steps whereby a composite control signal is generated.

4,694,499

DIRECTIONAL MICROPHONE WITH ACOUSTIC WASHER

Bruce Bartlett, Elkhart, Ind., assignor to Crown International, Inc., Elkhart, Ind.

Filed Feb. 13, 1985, Ser. No. 701,387
Int. Cl.[4] H04R *1/20, 1/34, 1/38*
U.S. Cl. 381—155 **3 Claims**



1. In a directional microphone including a head portion defining a sound chamber, a directional microphone cartridge positioned within said sound chamber, said cartridge including a front sound entry and a rear sound entry, the improvement comprising a washer formed of acoustic damping material and having front and rear sides positioned about said cartridge, with said washer front side adjacent said cartridge rear sound entry, said washer constituting means for reducing reflection of sounds approaching the front sound entry and absorbing high frequency sounds approaching said cartridge rear sound entry from said washer rear side.

4,694,500

CONTROL VOLTAGE GENERATING CIRCUIT FOR ACTIVATING A NOISE REDUCTION CIRCUIT IN AN FM STEREO RECEIVER

Satoru Tazaki; Yasuhiro Yoshioka, and Kiyoshi Amazawa, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1986, Ser. No. 834,980
Claims priority, application Japan, Mar. 6, 1985, 60-42822
Int. Cl.[4] H04H *5/00*
U.S. Cl. 381—10 **5 Claims**

1. A control voltage generating circuit for activating a noise reduction circuit in an FM stereo receiver which generates an S meter output voltage, comprising:

an in-phase amplifier in which negative ripple components in the S meter output voltage are entered;

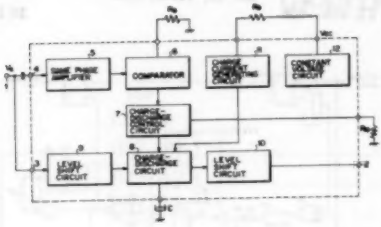
a first fixed voltage source fixing a first current value;

a comparator for comparing said first current value with a

second current value which is produced by said in-phase amplifier and which corresponds to said negative ripple components, and for supplying an output current when said second current value exceeds said first current value;

a charging and discharging circuit to which a capacitor is connected;

a charging and discharging control circuit which produces a control voltage responsive to said output current from



said comparator and controls a discharge from said capacitor via said charging and discharging circuit in response to said control voltage; and

a level shifting circuit which controls the level of d.c. components from the S meter output voltage in response to the discharge of said capacitor and produces a high-cut and high-blend control voltage corresponding to said d.c. components.

4,694,501

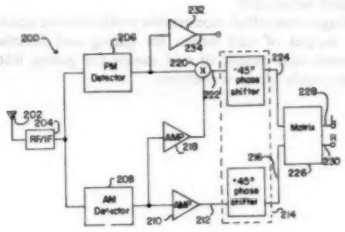
NONSYNCHRONOUS INDEPENDENT SIDE BAND AM STEREO DECODER

Fred T. Cheng, Cupertino, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 10, 1984, Ser. No. 680,026

Int. Cl.[4] H04H *5/00*

U.S. Cl. 381—15 **7 Claims**



1. A circuit for decoding an AM stereo signal comprising:

an input terminal adapted to receive an input signal having phase encoded and amplitude encoded information;

an AM detector coupled to said input terminal, said AM detector decoding said amplitude encoded information and providing an AM output signal on an AM output terminal indicative of said amplitude encoded information;

a PM detector coupled to said input terminal, said PM detector having a PM output terminal, said PM detector decoding said phase encoded information and providing a PM output signal on said PM output terminal indicative of said phase incoded information;

multiplying means for multiplying a first signal present on a first multiplier input times a second signal present on a second multiplier input, said first multiplier input being coupled to said PM output signal, said second multiplier input being coupled to said AM output terminal, said multiplying means placing the product of said first and second signals on a multiplier output terminal; and

phase shifting means for shifting phases, said phase shifting means having a first phase input, a second phase input, a first phase output and a second phase output, said first phase input being coupled to said multiplier output terminal, said second phase input being coupled to said AM detector, said phase shifting means shifting the phase of the signal on said first phase input and providing the result on said first phase output, said phase shifting means shifting the phase of the signal on said second phase input and placing the result on said second phase output.

4,694,502

COLOR IMAGE READING APPARATUS

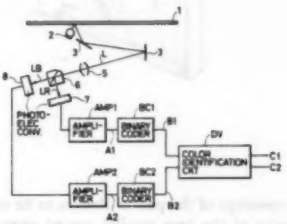
Kunitaka Ozawa, Tokyo; Naoki Ayata, Machida; Hidetoshi Suzuki, Tokyo; Seiji Saito, Yokosuka, and Noboru Koumura, Narashino, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 380,461, May 20, 1982, abandoned. This application Mar. 21, 1986, Ser. No. 842,763

Claims priority, application Japan, Jun. 1, 1981, 56-84714; Jul. 17, 1981, 56-112660; Oct. 8, 1981, 56-159387; Oct. 8, 1981, 56-159388; Oct. 9, 1981, 56-160151; Oct. 9, 1981, 56-160152; Oct. 9, 1981, 56-160153; Oct. 9, 1981, 56-160154

Int. Cl.[4] G06K *9/20*

U.S. Cl. 382—17 **7 Claims**



1. A multi-color image reading apparatus comprising:

photoelectric converting means for providing plural color separation signals corresponding to plural color-separated light beams from a multi-color image;

color identifying means for forming plural color signals, corresponding to colors of said multi-color image, from said plural color separation signals;

correcting means for correcting at least one of said color signals, said correcting means being adapted to utilize a color signal of a determined color for correcting other color signals; and

expanding means for expanding the color signal of said determined color, wherein the expanded color signal of said determined color is utilized for correcting other color signals.

4,694,503

CONTROL TOP BAG

Dennis Hydorn, 1260 Caledonia Road, Toronto, Ontario, Canada M6A 2X5

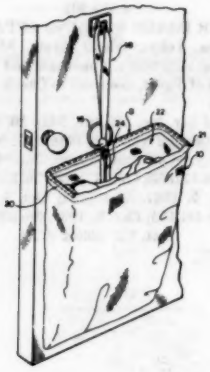
Filed Mar. 20, 1986, Ser. No. 841,812

Int. Cl.[4] B65D *33/06*

U.S. Cl. 383—12 **2 Claims**

1. An improved laundry bag and support therefor comprising: (a) a single piece support having a pair of parallel arms spaced from each other by a connector, the connector carrying a hanger incorporating a loop formed by bending the center of the connector for hanging the laundry bag, the plane of the hanger and the plane in which the pair of parallel arms are disposed creating an angle of slightly less than 90° whereby when the hanger is carried by a carrier the spaced arms are

oriented in a predetermined substantially horizontal plane thereby presenting the mouth of the laundry in a substantially horizontal plane; (b) a laundry bag carrying a pair of sleeves proximate the mouth of the bag, the pair of sleeves providing two adjacent openings each opening for receiving one of the two parallel spaced arms; (c) the laundry bag having a zipper opening proximate the pair of sleeves of (b) to permit the two



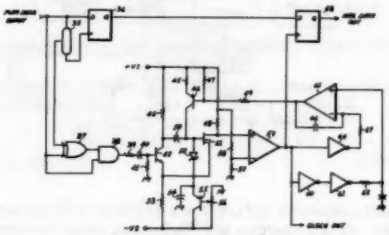
adjacent openings of the pair of sleeves to be spaced apart to permit entry of the two parallel spaced arms into the two openings of the pair of sleeves, whereby the laundry bag may be securely mounted on the support or removed from the support; (d) the pair of sleeves carrying a cinching cord whereby when the zipper is open the laundry bag may be removed from the support and the mouth of the laundry bag cinched closed.

4,694,504

SYNCHRONOUS, ASYNCHRONOUS, AND DATA RATE TRANSPARENT FIBER OPTIC COMMUNICATIONS LINK

David R. Porter, Roanoke; James H. Bowen, Salem, and John M. Holland, Shawsville, all of Va., assignors to ITT Electro Optical Products, a Division of ITT Corporation, Roanoke, V.I.

Filed Jun. 3, 1985, Ser. No. 740,149
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—608 **10 Claims**



1. A circuit for restoring symmetry to an unsymmetrical clock waveform derived from a pulse width modulated optical signal in an optic fiber communications system comprising:

means for receiving a pulse width modulated input signal;

means for delaying said pulse width modulated input signal to form a delayed pulse width modulated input;

means for combining said pulse width modulated input signal with said delayed pulse width modulated input to generate a waveform having one signal value only when one of but not both of said pulse width modulated input signal and said delayed pulse width modulated input are of a first signal value;

means for gating said pulse width modulated input signal with said waveform to generate another waveform having said one signal value only when both said pulse width modulated input signal and said waveform exhibit said one signal value; and

a voltage-controlled monostable multivibrator connected to an output of said means for gating and functioning to stretch said output of said means for gating into a 50% duty cycle clock waveform.

DESIGN PATENTS

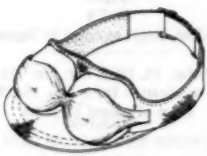
GRANTED SEP. 15, 1987

ERRATA

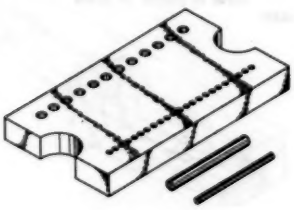
For CLASS	See PATENT NO.
D22-107	291,903
D22-107	291,904
D22-146	291,905

SEPTEMBER 15, 1987

291,840
NOVELTY CAP OR SIMILAR ARTICLE
Lonny R. Cameron, Rte. 1, Box 113AAA, Burton, Tex. 77835
Filed Feb. 7, 1986, Ser. No. 827,061
Term of patent 14 years
U.S. Cl. D2—248



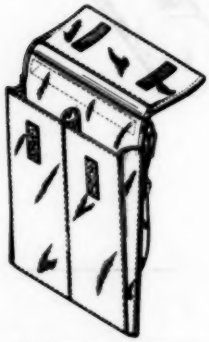
291,841
COMBINATION ADJUSTABLE BOW TIE PEG BOARD AND PEGS
Betty Owens, 3867 Gum Tree Rd., Winston-Salem, N.C. 27107
Filed Feb. 26, 1985, Ser. No. 705,810
Term of patent 14 years
U.S. Cl. D3—26



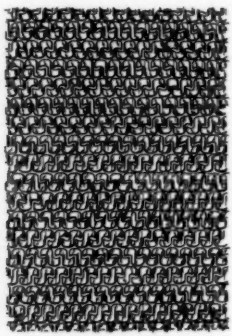
291,842
PROTECTIVE TRANSPORT CONTAINER FOR SPORTS EQUIPMENT
Edward W. Baumgardner, 4088 Sells Mill Rd., P.O. Box 1, Taneytown, Md. 21787
Filed Oct. 2, 1984, Ser. No. 657,067
Term of patent 14 years
U.S. Cl. D3—36

291,843
STACKABLE LEADER SPOOL CONTAINER
Robert Searle, 66 Broadway, San Francisco, Calif. 94111
Filed Oct. 19, 1984, Ser. No. 662,876
Term of patent 14 years
U.S. Cl. D3—38

291,844
PORTABLE FOOTWEAR TOTE BAG
Julie Gerver, and Howard Gerver, both of 345 E. 93rd St., New York, N.Y. 10128
Filed Jan. 21, 1986, Ser. No. 820,938
Term of patent 14 years
U.S. Cl. D3—42



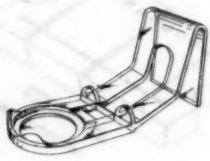
291,845
TEXTILE FABRIC
Tonino Lamborghini, via Calori 10, Bologna, Italy
Filed May 23, 1984, Ser. No. 613,599
Claims priority, application Italy, Nov. 23, 1983, 5086/83[U]
Term of patent 14 years
U.S. Cl. D5—56



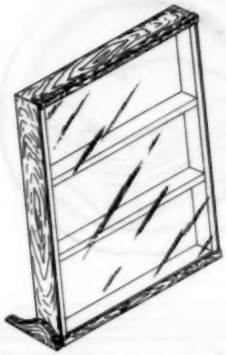
291,846
FRAME FOR A SWIVEL ROCKER
Marks M. Conn, Moorpark, Calif., assignor to Mallin Company, Los Angeles, Calif.
Filed Mar. 26, 1985, Ser. No. 716,186
Term of patent 14 years
U.S. Cl. D6—344

291,847
SOFA
Alberto Salvati, Milan, Italy, assignor to Saporiti Italia, S.p.A., Italy
Filed Mar. 15, 1985, Ser. No. 712,361
Claims priority, application Italy, Sep. 18, 1984, 23172/84[U]
Term of patent 14 years
U.S. Cl. D6—381

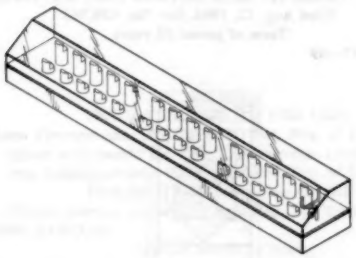
291,848
CUP AND SAUCER STAND
Christian B. Cadman, 309 East 24th Avenue, Vancouver, British Columbia, Canada V5V 1Z8
Filed Mar. 6, 1985, Ser. No. 708,598
Claims priority, application Canada, Sep. 21, 1984, 21-09-84-7
Term of patent 14 years
U.S. Cl. D6—466

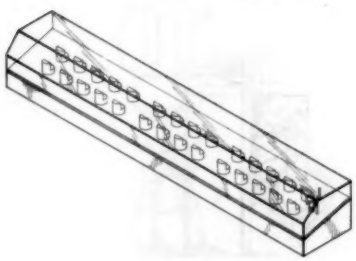


291,849
SPINNER BAIT DISPLAY CASE
Raymond H. Yates, P.O. Box 56, Rineyville, Ky. 40162
Filed Jan. 7, 1985, Ser. No. 689,403
Term of patent 14 years
U.S. Cl. D6—471



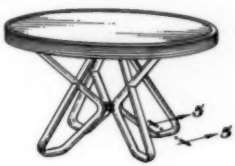
291,850
DISPLAY CASE FOR MINIATURE SPORTS HEADGEAR
Leonard L. Perkins, and Anthony Perkins, both of 4944 Twelfth St., NE., Washington, D.C. 20017
Filed Jan. 22, 1985, Ser. No. 693,243
Term of patent 14 years
U.S. Cl. D6—471



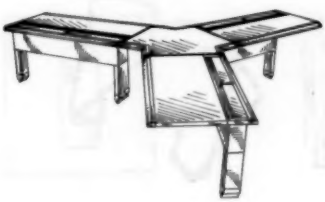


291,851
TABLE
Maurizio Salvato, Gallarate, Italy, assignor to Saporiti Italia S.p.A., Italy
Filed Mar. 15, 1985, Ser. No. 712,279
Claims priority, application Italy, Sep. 18, 1984, 23175/84[U]
Term of patent 14 years
U.S. Cl. D6—482

291,852
TABLE OR THE LIKE
Marks M. Conn, Moorpark, Calif., assignor to Mallin Company, Los Angeles, Calif.
Filed Mar. 26, 1985, Ser. No. 716,185
Term of patent 14 years
U.S. Cl. D6—487



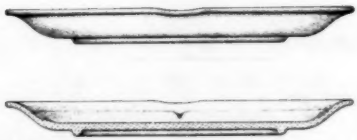
291,853
MULTIPLE DESK TOP UNIT
William R. Worrell, Hopkins, Minn., and Robert N. Laroche, Montreal, Canada, assignors to All-Steel Canada Ltd., Montreal, Canada
Filed Nov. 13, 1984, Ser. No. 670,037
The portion of the term of this patent subsequent to May 26, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—511



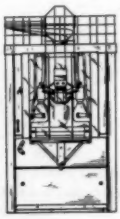
291,854
TURNTABLE FOR USE IN MICROWAVE OVENS
James F. Pomroy, St. Paul, and Allen M. Danley, Eagan, both of Minn., assignors to Plastics, Inc., St. Paul, Minn.
Filed Mar. 22, 1985, Ser. No. 715,109
Term of patent 14 years
U.S. Cl. D7—402

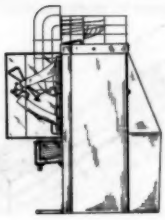
291,855
WIRE COOKING RACK
Arthur R. Erbach, Des Plaines, and James C. Stephen, Arlington Heights, both of Ill., assignors to Weber-Stephen Products Co., Palatine, Ill.
Continuation-in-part of Ser. No. 501,090, Jun. 6, 1983. This application Dec. 4, 1984, Ser. No. 677,824
Term of patent 14 years
U.S. Cl. D7—404

291,856
DINNER PLATE
Walter Everhan, Cologne, Fed. Rep. of Germany, assignor to American Commercial Inc., Secaucus, N.J.
Filed Feb. 3, 1984, Ser. No. 576,968
Term of patent 14 years
U.S. Cl. D7—30



291,857
AUTOMATIC JUICING MACHINE
Stewart C. Nelson, 215 Burns St., Forest Hills, N.Y. 11375
Filed Aug. 13, 1984, Ser. No. 639,742
Term of patent 14 years
U.S. Cl. D7—49





291,858

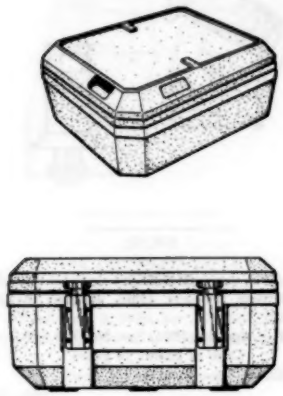
PORTABLE COOLER FOR ALLERGENIC EXTRACTS

John F. Baker, 45 Deerhaven Pl., Pleasant Hill, Calif. 94523, and Barry Dep, Castro Valley, Calif., assignors to John F. Baker, Concord, Calif.

Filed May 8, 1985, Ser. No. 732,350

Term of patent 14 years

U.S. Cl. D7—77



291,859

INSULATED JUG OR THE LIKE

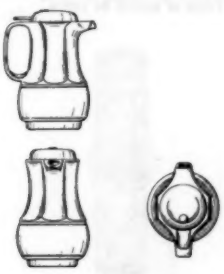
Anso Zimmermann, Bad Hersfeld, Fed. Rep. of Germany, assignor to Rotpunkt Dr. Anso Zimmermann, Limited Partnership Industriestrasse, Niederauls, Fed. Rep. of Germany

Filed Jul. 17, 1984, Ser. No. 631,822

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1984, 8AR23/84

Term of patent 14 years

U.S. Cl. D7—321



291,860

DOUBLE BOILER COOKING UTENSIL

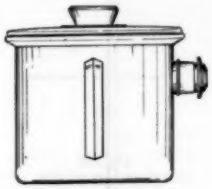
Robert Wallace, Bryanston, and Dragan Miskowic, Florida, both of South Africa, assignors to Danro Engineering (Proprietary) Limited, Maraisburg, South Africa

Filed Jan. 30, 1984, Ser. No. 575,067

Claims priority, application South Africa, Aug. 4, 1983, 83/0666

Term of patent 14 years

U.S. Cl. D7—360



291,861

COMBINATION PRYING TOOL FOR CAN COVERS AND TOOL HOLDER

Samuel C. Smith, 210 Hartman Rd., Newton, Mass. 02159

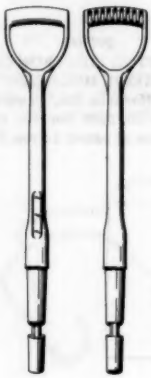
Filed Apr. 20, 1984, Ser. No. 602,411

Term of patent 14 years

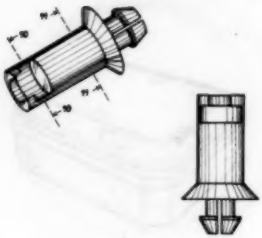
U.S. Cl. D8—37

291,862
TOOL HANDLE
Robert A. Kolonia, R.D. 3, Agnes Rd., Box 318, Milford, N.J. 08848
Filed May 16, 1985, Ser. No. 734,531
Term of patent 14 years
U.S. Cl. D8—107

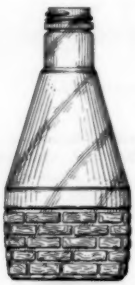
291,863
TOOL HANDLE
Robert A. Kolonia, R.D. 3, Agnes Rd., Box 318, Milford, N.J. 08848
Filed May 16, 1985, Ser. No. 734,532
Term of patent 14 years
U.S. Cl. D8—107



291,864
PRINTED CIRCUIT BOARD STAND-OFF
Royce W. Hill, Flippin, Ark., assignor to Micro Plastics, Inc., Flippin, Ark.
Filed Mar. 11, 1985, Ser. No. 710,418
Term of patent 14 years
U.S. Cl. D8—354



291,865
BOTTLE
Michele A. Carville, Wooster, Ohio, assignor to Kraft, Inc., Glenview, Ill.
Filed Apr. 10, 1985, Ser. No. 721,549
Term of patent 14 years
U.S. Cl. D9—322



291,866
COMBINED PACKAGING CONTAINER AND BREWING DEVICE FOR COFFEE OR THE LIKE
Michael F. Brice, Syosset, N.Y., assignor to Brice Ilotan Research Corporation, Syosset, N.Y.
Filed Dec. 6, 1984, Ser. No. 679,074
Term of patent 14 years
U.S. Cl. D9—337

291,867

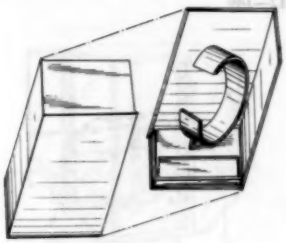
PACKAGING CONTAINER FOR A WRISTWATCH

Barry D. Berger, Brooklyn, N.Y., assignor to Timex Corporation, Waterbury, Conn.

Filed Feb. 6, 1985, Ser. No. 698,948

Term of patent 14 years

U.S. Cl. D9—430



291,868

CAP FOR CONTAINER

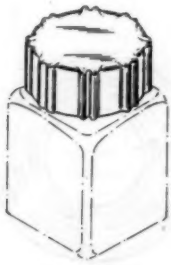
Brian R. Hindle, Frimley, England, assignor to Beecham Group p.l.c., England

Filed Nov. 2, 1984, Ser. No. 667,589

Claims priority, application United Kingdom, May 4, 1984, 841019449

Term of patent 14 years

U.S. Cl. D9—453



291,869

COMBINED WATCH AND BRACELET

Gianni Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy

Filed Apr. 17, 1985, Ser. No. 724,241

Claims priority, application Italy, Oct. 25, 1984, 36.174B/84

Term of patent 14 years

U.S. Cl. D10—32

291,870

COMBINED LIGHT AND SPEAKER HOUSING FOR AN EMERGENCY VEHICLE

Sigmund S. Urbanski, Alsip; Richard W. Condon, Frankfort, and Edward S. Stanuch, Oak Forest, all of Ill., assignors to Federal Signal Corporation, Oak Brook, Ill.

Filed May 6, 1985, Ser. No. 730,451

Term of patent 14 years

U.S. Cl. D10—114

291,871

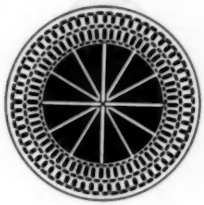
TIME DISPLAY

Warren L. Harvey, 134 Woodport Rd., Sparta, N.J. 07871

Filed Feb. 8, 1985, Ser. No. 699,579

Term of patent 14 years

U.S. Cl. D10—126



291,872

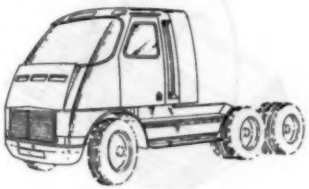
CAB-OVER-ENGINE TRUCK CAB

Wayne K. Simons; Roy L. Meryman; Larry W. Orr, and Donald A. Richardson, all of Kings County, Wash., assignors to Paccar Inc., Bellevue, Wash.

Filed Dec. 10, 1984, Ser. No. 680,141

Term of patent 14 years

U.S. Cl. D12—96

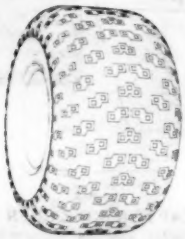


291,873
BICYCLE
Yoshio Koyama, 5-25-9 Kawabe-cho, Ohme-shi, Tokyo, Japan
Filed Jun. 11, 1985, Ser. No. 743,645
Term of patent 14 years
U.S. Cl. D12—111

291,874
MOTORCYCLE TIRE
Toshio Hayakawa, and Shinichiro Ohkuni, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Jun. 10, 1985, Ser. No. 743,187
Claims priority, application Japan, Dec. 14, 1984, 59-51174
Term of patent 14 years
U.S. Cl. D12—147

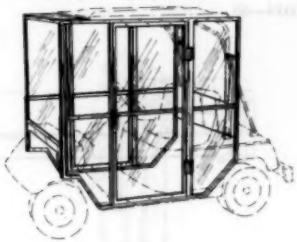
291,875
AUTOMOBILE TIRE
Toshio Hayakawa, Tokyo, and Toru Osawa, Saitama, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Mar. 14, 1985, Ser. No. 711,775
Claims priority, application Japan, Sep. 18, 1984, 59-38394
Term of patent 14 years
U.S. Cl. D12—147

291,876
AUTOMOBILE TIRE
Toshio Hayakawa; Yasuo Himuro, both of Tokyo, and Toru Osawa, Saitama, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Mar. 14, 1985, Ser. No. 711,558
Claims priority, application Japan, Sep. 18, 1984, 59-38392
Term of patent 14 years
U.S. Cl. D12—149

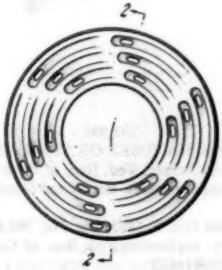


291,877
AUTOMOBILE TIRE
Hideaki Nishio, Saitama, and Kiyoshi Takase, Tokyo, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Mar. 14, 1985, Ser. No. 711,798
Claims priority, application Japan, Sep. 18, 1984, 59-38393
Term of patent 14 years
U.S. Cl. D12—151

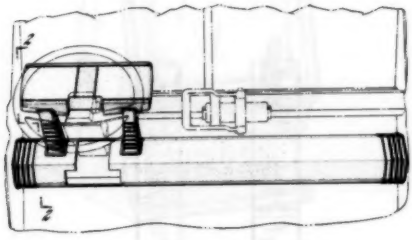
291,878
DETACHABLE PASSENGER COMPARTMENT FOR A GOLF CART
Gregory D. Cook, Duncan, Okla., assignor to Cook Manufacturing Corporation, Duncan, Okla.
Filed Jan. 14, 1985, Ser. No. 691,051
Term of patent 14 years
U.S. Cl. D12—156



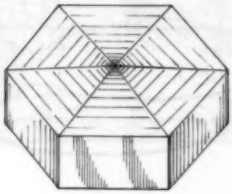
291,879
WHEEL COVER
William F. Boyle, Sterling Heights, and Maurice P. Chandler, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Mar. 15, 1985, Ser. No. 712,087
Term of patent 14 years
U.S. Cl. D12—209



291,880
INSTRUMENT PANEL
Stuart B. Shuster, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Feb. 21, 1985, Ser. No. 703,756
Term of patent 14 years
U.S. Cl. D12—192



291,881
BOAT
Nicholas J. Koushiafes, Highland, Ind., assignor to Investment Associates, Inc., Highland, Ind.
Continuation-in-part of Ser. No. 212,108, Dec. 2, 1980. This application Aug. 12, 1983, Ser. No. 522,591
Term of patent 14 years
U.S. Cl. D12—300



291,882
DICTATING MACHINE
John W. Hoover, Huntington; Richard G. Rutkowski, Milford, and Rocco Luppino, South Norwalk, all of Conn., assignors to Dictaphone Corporation, Rye, N.Y.
Filed Dec. 3, 1984, Ser. No. 677,418
Term of patent 14 years
U.S. Cl. D14—3

291,883

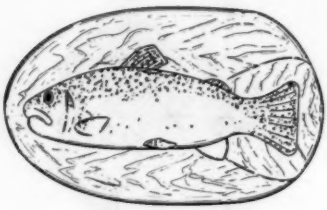
HANDSET TELEPHONE AND BASE COMBINATION

Robert Snyder, Tallmage, Ohio, assignor to Outdoor Horizons, Inc., Akron, Ohio

Filed Oct. 2, 1986, Ser. No. 914,745

Term of patent 14 years

U.S. Cl. D14—53



291,884

BASE STATION FOR A CORDLESS TELEPHONE OR THE LIKE

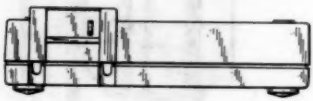
Wolfgang Muenscher, Munich, and Siegfried Schoen, Starnberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

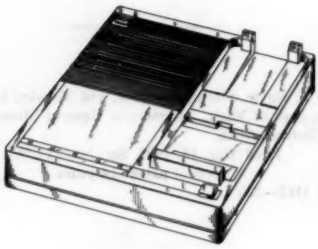
Filed Nov. 23, 1984, Ser. No. 674,186

Claims priority, application Fed. Rep. of Germany, May 22, 1984, MRBD.10NR13903

Term of patent 14 years

U.S. Cl. D14—60





291,885

TELEPHONE HANDSET OR SIMILAR ARTICLE

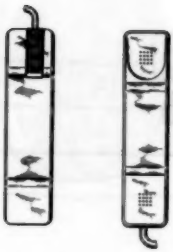
Harry Hentschel, Olching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 9, 1985, Ser. No. 785,658

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1985, MR BD10NR16135

Term of patent 14 years

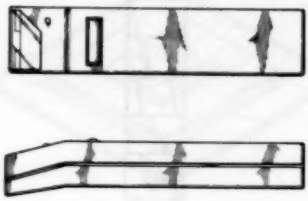
U.S. Cl. D14—63



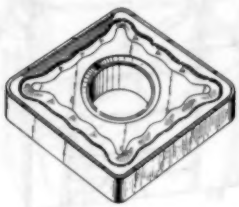
291,886
RADIO PAGER OR SIMILAR ARTICLE
William J. Scheid, Coral Springs, and Robert Kurcbart, Boca Raton, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Nov. 27, 1985, Ser. No. 802,504
Term of patent 14 years
U.S. Cl. D14—68

291,887
COMBINED TELEVISION RECEIVER AND VIDEO TAPE RECORDER
Henry F. Oscar, Stamford, Conn., assignor to Oscarvision Systems, Inc., Old Greenwich, Conn.
Filed May 31, 1985, Ser. No. 739,796
Term of patent 14 years
U.S. Cl. D14—79

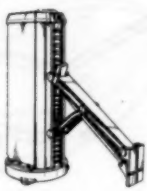
291,888
TRANSMITTER OR SIMILAR ARTICLE
Peter Fong, Los Angeles, Calif., and Tsang H. T. Henry, Kowloon, Hong Kong, assignors to Tradebest International Corporation, Whittier, Calif.
Filed Jan. 3, 1985, Ser. No. 688,595
Term of patent 14 years
U.S. Cl. D14—95



291,889
CUTTING INSERT
Lars T. Pettersson, Gävle, and Jörgen V. Wiman, Sandviken, both of Sweden, assignors to Santrade Limited, Switzerland
Filed Apr. 18, 1985, Ser. No. 724,573
Claims priority, application Sweden, Oct. 18, 1984, 84-2783
Term of patent 14 years
U.S. Cl. D15—139

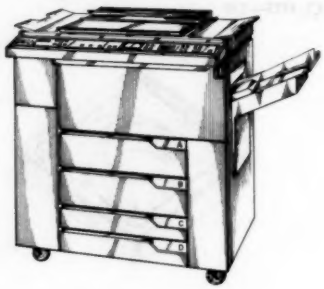


291,890
INDUSTRIAL ROBOT
Akifumi Inoue, and Koshiro Takeda, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan
Filed May 8, 1985, Ser. No. 731,796
Claims priority, application Japan, Nov. 16, 1984, 59-47217
Term of patent 14 years
U.S. Cl. D15—199



291,891
PROJECTION ENCLOSURE
James W. Clifford, St. Paul, and Rodney I. Eaton, Minneapolis, both of Minn., assignors to Associated Images, Inc., Minneapolis, Minn.
Filed Mar. 21, 1985, Ser. No. 714,689
Term of patent 14 years
U.S. Cl. D16—14

291,892
COPYING MACHINE
Donald W. Carr, Binghamton, and Andrew T. Serbinski, Brooklyn, both of N.Y., assignors to Savin Corporation, Stamford, Conn.
Filed Jun. 24, 1985, Ser. No. 748,041
Term of patent 14 years
U.S. Cl. D16—30

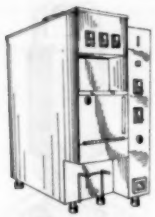


291,893
TUBULAR EYEGLASS FRAME
Eric Lipson, 213 S. Bonsal St., Philadelphia, Pa. 19103
Filed Jan. 3, 1985, Ser. No. 688,463
Term of patent 14 years
U.S. Cl. D16—102

291,894
EYEGLASS RETAINING CORD WITH ADJUSTABLE SLIDE
George Weisenfeld, and David Halpern, both of Studio City, Calif., assignors to International Tropic-Cal, Inc., Los Angeles, Calif.
Filed Sep. 4, 1984, Ser. No. 647,018
Term of patent 14 years
U.S. Cl. D16—123

291,895
THERMOSTAT MAGNIFIER
Gerald R. Steiner, 2033 Virginia Ave. South, St. Louis Park, Minn. 55426
Division of Ser. No. 616,571, Jun. 4, 1984, Pat. No. Des. 288,670. This application Aug. 25, 1986, Ser. No. 899,673
Term of patent 14 years
U.S. Cl. D16—134

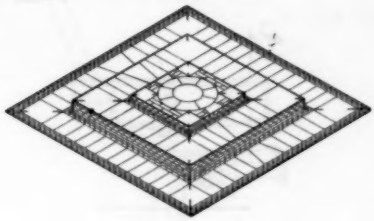
291,896
COIN OPERATED COFFEE BREWER
Kenneth W. Stover, Springfield, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.
Filed Nov. 9, 1984, Ser. No. 669,863
Term of patent 14 years
U.S. Cl. D20—5



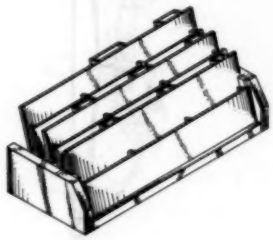
291,897
IDENTIFICATION TAG
William P. Flies, Burnsville, Minn., assignor to Datakey, Inc., Burnsville, Minn.
Filed Feb. 15, 1985, Ser. No. 702,145
Term of patent 14 years
U.S. Cl. D20—22

291,898
IDENTIFICATION TAG
Susan Smith, San Francisco County, Calif., assignor to Tagums, Inc., Wilmette, Ill.
Filed Nov. 19, 1984, Ser. No. 672,826
Term of patent 14 years
U.S. Cl. D20—24

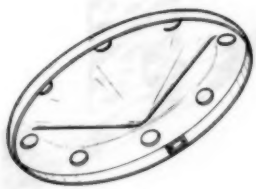
291,899
THREE-DIMENSIONAL GAME BOARD
Douglas M. Hanson; Jeff D. Hanson, and Brian E. Hanson, all of Nashua, N.H., assignors to JMBL Corporation, Nashua, N.H.
Filed Dec. 18, 1984, Ser. No. 683,207
Term of patent 14 years
U.S. Cl. D21—23



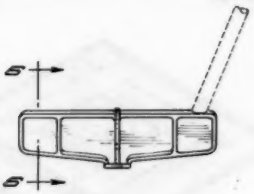
291,900
RACK FOR HOLDING CARDS USED IN TEACHING MATHEMATICS
Vernon J. Mortensen, Coeur d'Alene, Id., assignor to Mortensen Educational Products, Inc., Chatsworth, Calif.
Filed Apr. 1, 1985, Ser. No. 718,639
Term of patent 14 years
U.S. Cl. D21—54



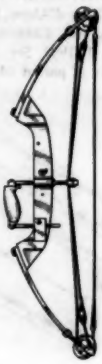
291,901
AERIAL TOY
Doug Chapman, 13771 Hovey, Warren, Mich. 48089
Filed Apr. 25, 1985, Ser. No. 727,076
Term of patent 14 years
U.S. Cl. D21—86



291,902
GOLF CLUB HEAD
Frank D. Werner, Box SR9, Jackson, Wyo. 83001
Filed Mar. 1, 1985, Ser. No. 707,415
Term of patent 14 years
U.S. Cl. D21—219



291,903
COMPOUND BOW WITH A CABLE TENSION ADJUSTMENT
Donald E. Smith, 1882 E. Larch, Simi Valley, Calif.
Filed Apr. 29, 1985, Ser. No. 728,173
Term of patent 14 years
U.S. Cl. D22—107

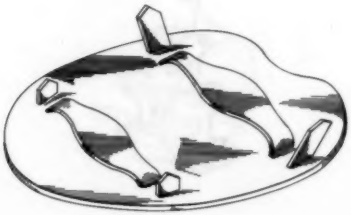


291,904
BOW SIGHT
George C. Lott, Rte. 3, Box 463, Scottsboro, Ala. 35768
Filed May 28, 1985, Ser. No. 737,936
Term of patent 14 years
U.S. Cl. D22—107

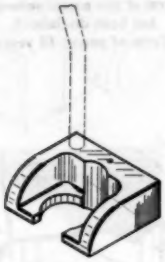
291,905
FISHING JUG
Howard Brachear, 12 Sunset Acres, Farmersville, Ill. 62533
Filed Apr. 8, 1985, Ser. No. 720,865
Term of patent 14 years
U.S. Cl. D22—146

291,906
STUFFED DOG
Barbara B. Riddle, 525 Erna, Converse, Tex. 78209
Filed Feb. 27, 1985, Ser. No. 706,427
Term of patent 14 years
U.S. Cl. D21—161

291,907
HAND BAT
Elmer George, 195 Armour Dr., Washington, Pa. 15301
Filed Feb. 14, 1985, Ser. No. 701,693
Term of patent 14 years
U.S. Cl. D21—213



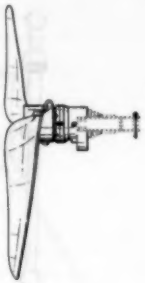
291,908
GOLF CLUB PUTTER HEAD
Wayne P. Glennon, 12029 Linkcrest Dr., South, Fort Worth, and Mack E. Taylor, 4020 Link Meadow Dr., Aledo, both of Tex. 76008
Filed Mar. 1, 1985, Ser. No. 707,416
Term of patent 14 years
U.S. Cl. D21—217



291,909
SKI POLE HANDLE
Thomas Z. Lajos, 2454 W. Oakfield Rd., Grand Island, N.Y. 14072
Filed Mar. 26, 1985, Ser. No. 716,162
Term of patent 14 years
U.S. Cl. D21—230

291,910
FLOAT
Henry S. Wolfe, 14480 62nd St. North, Clearwater, Fla. 33520
Filed Oct. 18, 1985, Ser. No. 789,136
The portion of the term of this patent subsequent to Sep. 1, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—237

291,911
SUBMERSIBLE UNIT FOR MIXING AND AERATION OF INDUSTRIAL EFFLUENT OR THE LIKE
Hjalmar Fries, Spanga, Sweden, assignor to ITT Industries, Inc., New York, N.Y.
Filed Sep. 7, 1984, Ser. No. 648,903
Claims priority, application Sweden, Mar. 7, 1984, 840780
Term of patent 14 years
U.S. Cl. D23—1



291,912

COMBINED HAND SHOWER, ADJUSTABLE HOLDER AND ARTICLE HOLDER

Wolfgang Fabian, Mannheim, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.

Filed Sep. 18, 1985, Ser. No. 777,476

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1985, 20 MR 0250

Term of patent 14 years

U.S. Cl. D23—35

291,913

GAS FIRE

Roger Tucker, Kidderminster; Paul A. Gillam, Great Barr; Peter Wright, Sutt on Coldfield; Donald Whitehouse, Castle Bromwich; Michael C. Broadbent, West Heath, and Charles Moran, Willenhall, all of England, assignors to Valor Heating Limited, London, England

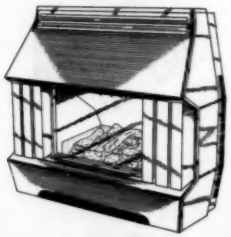
Filed Mar. 20, 1985, Ser. No. 713,859

Claims priority, application United Kingdom, Oct. 3, 1984, 1022430; Nov. 7, 1984, 1023152

The portion of the term of this patent subsequent to Jul. 7, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D23—97



291,914

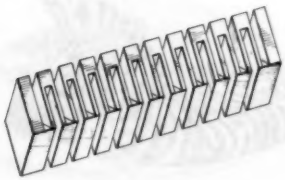
CHANNEL BODY FOR AN AIR SUPPLY REGISTER

Knut E. Bergdahl, Kvartsgränd 4, S-852 52 Sundsvall, Sweden

Continuation of Ser. No. 577,259, Feb. 6, 1984. This application Feb. 12, 1986, Ser. No. 812,716

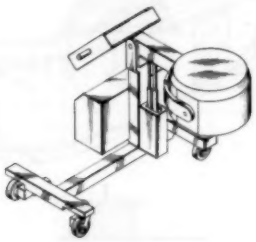
Term of patent 14 years

U.S. Cl. D23—112



291,915
COMBINED MOBILE IMAGING AND SCANNING MACHINE FOR RADIATION DETECTION
James R. Davis, 7122 Tiara La., La Palma, Calif. 90623
Filed Mar. 19, 1985, Ser. No. 713,443
Term of patent 14 years
U.S. Cl. D24—2

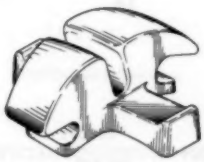
291,916
COMBINED MOBILE IMAGING AND SCANNING MACHINE FOR RADIATION DETECTION
James R. Davis, 7122 Tiara La., La Palma, Calif. 90623
Filed Mar. 19, 1985, Ser. No. 713,456
Term of patent 14 years
U.S. Cl. D24—2



291,917
DISPOSABLE CUSHION PAD FOR INTRA-ORAL X-RAY FILMS
Donald C. Simpson, 5555 Shawnee Dr., Sierra Vista, Ariz. 85635
Filed Nov. 15, 1985, Ser. No. 805,229
Term of patent 14 years
U.S. Cl. D24—2

291,918
INSERTER FOR FEMALE CONTRACEPTIVES
Marc Spits, Hamont-Achel, Belgium, assignor to Homesteel Achel P.V.B.A., Belgium
Filed Dec. 4, 1984, Ser. No. 678,054
Claims priority, application Int'l Pat. Institute, Jun. 4, 1984, DM/003.813
Term of patent 14 years
U.S. Cl. D24—8

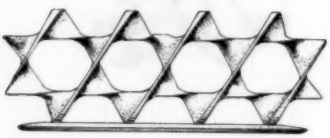
291,919
ORTHODONTIC BRACKET
James M. Reynolds, Lubbock, Tex., assignor to Zulauf, Lubbock, Tex.
Filed Dec. 30, 1985, Ser. No. 814,779
Term of patent 14 years
U.S. Cl. D24—10



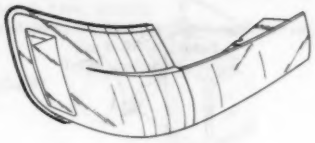
291,920
CARDIOTOMY RESERVOIR
Takashi Monzen, Tama, and Masaru Wada, Tokyo, both of Japan, assignors to Terumo Corporation, Tokyo, Japan
Filed Apr. 23, 1985, Ser. No. 726,063
Claims priority, application Japan, Oct. 25, 1984, 59-43879
Term of patent 14 years
U.S. Cl. D24—56

291,921
LAMP
Ronald G. Blaisdell, Saugus, and Peter R. Gagnon, Georgetown, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.
Filed Feb. 25, 1983, Ser. No. 469,846
Term of patent 14 years
U.S. Cl. D26—2

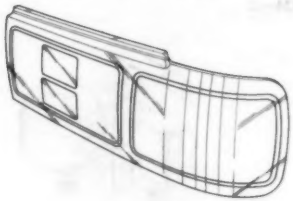
291,922
CANDELABRA
Craig R. Schaffer, 191 Mill St., Pataskala, Ohio 43062
Filed Apr. 10, 1985, Ser. No. 721,787
Term of patent 14 years
U.S. Cl. D26—14



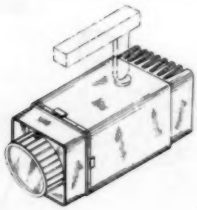
291,923
FRONT COMBINATION LAMP FOR AN AUTOMOBILE
Tsutomu Kawaguchi, Toyota, Japan, assignaor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Jul. 31, 1985, Ser. No. 760,971
Term of patent 14 years
U.S. Cl. D26—28



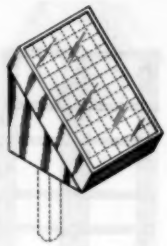
291,924
REAR COMBINATION LAMP FOR AN AUTOMOBILE
Mitsunori Miyazaki, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Jul. 31, 1985, Ser. No. 760,972
Term of patent 14 years
U.S. Cl. D26—28



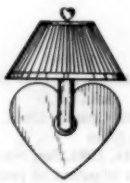
291,925
FRAMING PROJECTOR FOR TRACK LIGHTING SYSTEM
Romeo A. Ducanay, Schaumburg, Ill., assignor to Cooper Industries, Houston, Tex.
Filed Dec. 31, 1984, Ser. No. 687,839
Term of patent 14 years
U.S. Cl. D26—61



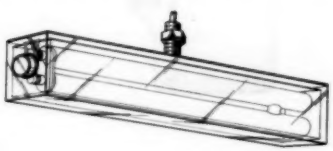
291,926
SOLAR POWERED LIGHT HOUSING
Dennis R. Schlepp, Golden, Colo., assignor to Texas HiTech, Oklahoma City, Okla.
Filed Jun. 22, 1984, Ser. No. 623,378
Term of patent 14 years
U.S. Cl. D26—67



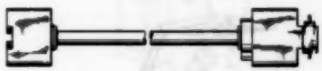
291,927
WALL LAMP
Daniel E. Priddy, Rte. #1, Box 429, Summerfield, N.C. 27358
Filed Jul. 13, 1984, Ser. No. 630,418
Term of patent 14 years
U.S. Cl. D26—73



291,928
FLUORESCENT LIGHTING FIXTURE
John F. Morten, P.O. Box 326, Dover, Mass. 02030
Filed Jun. 3, 1985, Ser. No. 740,330
Term of patent 14 years
U.S. Cl. D26—76



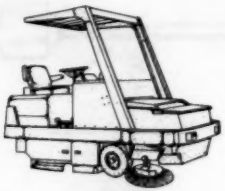
291,929
TRACK LIGHT EXTENSION ARM
Raymond J. Kusmer, Elgin, Ill., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Mar. 12, 1984, Ser. No. 588,521
Term of patent 14 years
U.S. Cl. D26—138



291,930
APPLIANCE FOR SMOOTHING FIBER APPLIED TO FINGERNAILS
Brenda J. Kilman, 420 W. 41st St., San Bernardino, Calif. 92407, and Betty J. Cowart, 751 S. Sycamore, Rialto, Calif. 92376
Filed Mar. 11, 1985, Ser. No. 710,507
Term of patent 14 years
U.S. Cl. D28—59

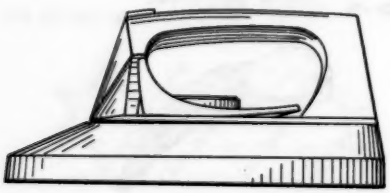
291,931
ARTIFICIAL FINGERNAIL FILE
Linda D. Thompson-Cash, 624 Oakshire Ave., Modesto, Calif. 95355
Filed Nov. 18, 1985, Ser. No. 805,172
Term of patent 14 years
U.S. Cl. D28—59

291,932
MACHINE FOR FLOOR SWEEPING AND SCRUBBING
Christopher M. Knowlton, and Robert J. O'Hara, both of Moore County, N.C., assignors to AAR Brooks & Perkins Corp., Aberdeen, N.C.
Continuation-in-part of Ser. No. 642,192, Aug. 20, 1984. This application Nov. 23, 1984, Ser. No. 674,151
Term of patent 14 years
U.S. Cl. D32—4

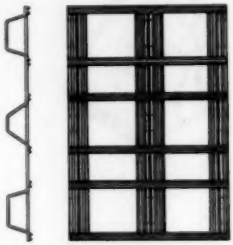


291,933
PLUMBING TRAP CLEANING TOOL
Charles Weiss, 121 Hillcrest Park Rd., Cos Cob, Conn. 06807
Filed Mar. 14, 1984, Ser. No. 589,529
Term of patent 14 years
U.S. Cl. D32—14

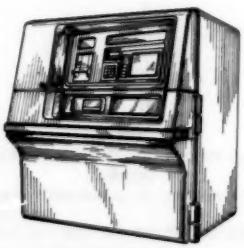
291,934
IRON
Carlo Bertani, Montechiarugolo, Italy, assignor to B e B S.r.l., Parma, Italy
Filed Dec. 13, 1985, Ser. No. 808,641
Claims priority, application Italy, Sep. 9, 1985, 22949/85[U]
Term of patent 14 years
U.S. Cl. D32—70

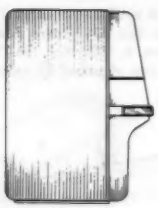


291,935
LOADING PALLET
Claes Nordström, John Landvallsgatan 66, S-230 44 Vintrie, Sweden
Filed Nov. 8, 1984, Ser. No. 669,574
Claims priority, application Sweden, May 9, 1984, 84-1479
Term of patent 14 years
U.S. Cl. D34—38

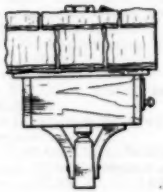


291,936
AUTOMATED TELLER MACHINE OR SIMILAR ARTICLE
Douglas G. Long, North Canton, Ohio, assignor to Diebold Incorporated, Canton, Ohio
Filed Dec. 14, 1984, Ser. No. 681,982
Term of patent 14 years
U.S. Cl. D99—28

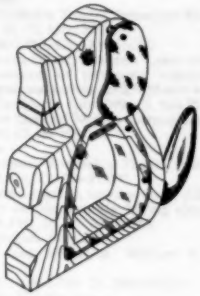




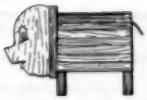
291,937
MAIL BOX
Kenneth G. Fisher, 40379 Road 96, Dinuba, Calif. 93618
Filed Apr. 8, 1985, Ser. No. 720,959
Term of patent 14 years
U.S. Cl. D99—30



291,938
DOG BANK
Levi Kauffman, R.R. 2, Box 29-D, Topeka, Ind. 46571
Filed Jan. 23, 1985, Ser. No. 693,809
Term of patent 14 years
U.S. Cl. D99—40



291,939
COIN BANK OR THE LIKE
Charles Bennett, 48 Osborne Ave., Mt. Sinai, N.Y. 11766
Filed Feb. 26, 1985, Ser. No. 705,653
Term of patent 14 years
U.S. Cl. D99—40



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF SEPTEMBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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AB Volvo: *See*—
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Adams, Peter F.; and Cowan, Colin F. N., to Briish Telecommunications public limited company. Adaptive digital filter. 4,694,451, Cl. 370-32.100.

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Albrecht, Karl-Hans; Luhr, Hartmut; and Pieck, Gunter, to Halbergerhutte GmbH. Apparatus for producing by the casting technique a cooling means for webs between adjacent cylinders of a cylinder block and a cylinder block produced accordingly. 4,693,294, Cl. 164-312.000.

Alcantara, Miguel A.: *See*—
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Wupper, Hans; and Buschmann, Gunther, 4,693,522, Cl. 303-105.000.
Alfredsson, Alf I.; and Persson, Kjell A., to Victor Hasselblad AB. Arrangement for winding cameras. 4,693,579, Cl. 354-173.100.
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Allegra, Carmen; Drake, James C.; Chabner, Bruce A.; Masur, Henry; and Kovacs, Joseph A., to United States of America, Health and Human Services. Use of trimetrexate as antiparasitic agent. 4,694,007, Cl. 514-260.000.
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Allison Corporation: *See*—
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Alper, Howard; and Smith, David J. H., to British Petroleum Company p.l.c., The. Carbamate ester production. 4,694,097, Cl. 560-24.000.
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Saiki, Atsushi; Suzuki, Michio; Sunami, Hideo; Asai, Shojiro; Maki, Michiyoshi; and Asami, Kinichiro, 4,693,173, Cl. 98-31.500.

Asano, Tetsuro, to Sanyo Electric Co. Semiconductor integrated circuit having multiple-layered connection. 4,694,320, Cl. 357-40.000.

Asars, Juris A.: *See*—
Miller, Robert C.; and Asars, Juris A., 4,694,243, Cl. 324-96.000.

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ASEA AB: *See*—
Hellgren, Keijo, 4,693,103, Cl. 72-63.000.

ASEA Aktiebolag: *See*—
Kristola, Osvald; and Korpela, Paavo, 4,692,983, Cl. 29-432.000.
Svedberg, Per, 4,694,315, Cl. 357-23.130.

Ashcraft, Robert W., to E.I. Du Pont de Nemours and Company. Adhesion promotion in photoresist lamination and processing. 4,693,959, Cl. 430-323.000.

Ashley, Paul R., to United States of America, Army. Amorphous silicon spatial light modulator. 4,693,561, Cl. 350-336.000.

Asick, John C.; Douty, George H.; and Staron, James S., to AMP Incorporated. Surface mount connector with floating terminals. 4,693,528, Cl. 439-83.000.

Astra-Tech Aktiebolag: *See*—
Lundback, Stig, 4,693,714, Cl. 623-3.000.

Atchisson, Maxwell G. Firing mechanism for firearm. 4,693,170, Cl. 89-149.000.

Atkinson, Frederick G.; Kobrinetz, Anthony; and Menich, Barry J., to Motorola, Inc. Cellular radiotelephone land station. 4,694,484, Cl. 379-59.000.

Atochem: *See*—
Hilaire, Jean-Claude; and Guerin, Roland, 4,694,063, Cl. 528-315.000.

Atom Sciences, Inc.: *See*—
Payne, Marvin G.; Thonnard, Norbert; and Hurst, George S., 4,694,167, Cl. 250-282.000.

Atsumi, Shigeru: *See*—
Tanaka, Sumio; Saito, Shinji; Atsumi, Shigeru; and Ohtsuka, Nobuaki, 4,694,429, Cl. 365-189.000.

Attri, Arun K.: *See*—
Minton, Allen P.; Attri, Arun K.; and Sullivan, James V., 4,693,984, Cl. 436-180.000.

Atwal, Karnail: *See*—
Floyd, David; and Atwal, Karnail, 4,694,002, Cl. 514-211.000.

Atwell, Thomas L.: *See*—
Proctor, Raymond J.; Atwell, Thomas L.; Lingren, Clinton L.; and Miller, James F., 4,694,165, Cl. 250-252.100.

Aubert, Gilles, to Commissariat a l'Energie Atomique. Device for removably fixing an internal structure to a circular wall inside an envelope. 4,693,279, Cl. 138-108.000.

Aubree, Jean: *See*—
Denhez, Alain; Hargoaa, Francis; and Aubree, Jean, 4,694,291, Cl. 340-825.200.

Audibert, Francoise: *See*—
Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Chedid, Louis; Choay, Jean; and Lederer, Edgar, 4,693,998, Cl. 514-62.000.

Aula, Jouko; and Kerttula, Reima, to Valmet Oy. Suction roll and method for applying a negative pressure over a sector of a roll. 4,693,784, Cl. 162-202.000.

Auth, Gerald L., to MIDAC Corporation. Ruggedized compact interferometer requiring minimum isolation from mechanical vibrations. 4,693,603, Cl. 356-346.000.

Automation Industries, Inc.: *See*—
Choiniere, Alcide W.; and Dunn, George T., Jr., 4,693,324, Cl. 174-47.000.

Avisse, Jean-Bernard, to Societe Anonyme: Societe Europeenne de Propulsion. Movable core transducer. 4,694,246, Cl. 324-207.000.

Avny, Sam. Concealed mounted push bars and grills. 4,692,962, Cl. 16-111.00R.

Axelsson, Bengt I.; Brattsand, Ralph L.; Dahlback, Carl M. O.; Kallstrom, Leif A.; and Trofast, Jan W., to Aktiebolaget Draco. Liposomes containing steroid esters. 4,693,999, Cl. 514-174.000.

Ayata, Naoki: *See*—
Ozawa, Kunitaka; Ayata, Naoki; Suzuki, Hidetoshi; Saito, Seiji; and Koumura, Noboru, 4,694,502, Cl. 382-17.000.

Ayer, Atul D., to Alza Corporation. Osmotic device with inert core. 4,693,886, Cl. 424-15.000.

Azami, Katsumasa: *See*—
Fukai, Isamu; and Azami, Katsumasa, 4,693,674, Cl. 417-269.000.

Azegami, Osamu; and Miyake, Toshifumi, to Kabushiki Kaisha Ishida Koki; and Yac Co., Limited. Method and apparatus for sorting articles. 4,693,378, Cl. 209-586.000.

B & D Autolines AB: *See*—
Karlsson, Gosta, 4,693,154, Cl. 83-161.000.

B. F. Goodrich Company, The: *See*—
Edwards, Walter A.; and Huddleston, George R., Jr., 4,693,800, Cl. 204-180.100.

Baba, Kiyokazu, to Kabushiki Kaisha Komatsu Seisakusho. Transfer press. 4,693,361, Cl. 198-621.000.

Babcock & Wilcox Company, The: *See*—
Kalen, David D., 4,693,389, Cl. 220-236.000.

Babich, Edward D.; Hatzakis, Michael; Liutkis, John J.; Parasczak, Juri R.; and Shaw, Jane M., to International Business Machines Corporation. Photolithographic etching process using organosilicon polymer composition. 4,693,960, Cl. 430-323.000.

Babineaux, Jules: *See*—
Amy, A. Andre ; and Babineaux, Jules, 4,693,102, Cl. 72-53.000.

Bacardit, Juan S., to Bendiberica S.A. Electro-optical torque sensing device for an actuating mechanism. 4,693,123, Cl. 73-862.330.

Bacskai, Endre; Retfalvi, Ferenc; and Sasdi, Andras, to Kohaszati Cyaropito Vallalat Gepipari Technologiai Intezet. Video-radiographic process and equipment for a quality controlled weld seam. 4,694,479, Cl. 378-58.000.

Baeger, Holm, to VDO Adolf Schindling AG. Liquid-crystal cell with depressions for wider viewing angle. 4,693,559, Cl. 350-334.000.

Baehrle, Friedrich; Wulf, Helmut; and Kreeb, Helmut, to Daimler-Benz Aktiengesellschaft. Method for heating a road by means of geothermally fed heating installation as well as a road-heating installation for carrying out the method. 4,693,301, Cl. 165-45.000.

Bagwell, Charles, Jr., to Howden Coloney, Inc. Strap for linked container article carrier. 4,693,167, Cl. 89-35.010.

Baird Corporation: *See*—
Croteau, Francis R., 4,694,398, Cl. 364-414.000.

Baity, Frederick W.: *See*—
Owens, Thomas L.; Baity, Frederick W.; Hoffman, Daniel J.; and Whealton, John H., 4,694,264, Cl. 333-34.000.

Baker, Anna M., to Baker, Kenneth R.; and Derosier, Paul G. Pick-up device for lawn debris. 4,693,504, Cl. 294-1.100.

Baker, Daniel C., to Shell Oil Company. HCN and iron cyanide complex removal. 4,693,873, Cl. 423-215.500.

Baker, Donal E., to Westinghouse Electric Corp. Electromechanical constant speed drive generating system. 4,694,187, Cl. 290-4.00R.

Baker, Gordon R.: *See*—
Podolsky, Richard J.; Baker, Gordon R.; and Brenner, Bernhard, 4,693,606, Cl. 356-355.000.

Baker, Kenneth R.: *See*—
Baker, Anna M., 4,693,504, Cl. 294-1.100.

Balaban, Alvin R.: *See*—
Demmer, Walter H.; Harwood, Leopold A.; Patel, Chandrakant B.; and Balaban, Alvin R., 4,694,327, Cl. 358-19.000.

Balboni, John J.: *See*—
Hong, Leon; and Balboni, John J., 4,693,899, Cl. 426-94.000.

Baldi, Alfonso L., to Alloy Surfaces Company, Inc. Metal diffusion and use. 4,694,036, Cl. 524-473.000.

Balian, Charles: *See*—
Agarwal, Arun K.; and Balian, Charles, 4,693,920, Cl. 428-40.000.

Ballard, Jerry L.; Chatham, Dale; and Gaulke, Gerald E. Video display control. 4,694,392, Cl. 364-200.000.

Ballard, Stephen C.: *See*—
Payet, George L.; and Ballard, Stephen C., 4,693,771, Cl. 156-73.300.

Ballestrazzi, Aris; and Tassi, Lamberto, to SITMA Societa Italiana Macchine Automatiche S.p.A. Device for controlling the unwinding of a plastics film in a packaging machine. 4,693,053, Cl. 53-389.000.

Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, to Basf Aktiengesellschaft. Preparation of alkali metal and alkaline earth metal salts of acyloxybenzenesulfonic acids. 4,693,848, Cl. 260-402.000.

Bando, Akira: *See*—
Haraguchi, Eiji; Nakagawa, Hiroto; Bando, Akira; Kuwahara, Takao; Nohara, Haruo; and Ono, Kenichi, 4,694,189, Cl. 290-40.00C.

Bankel, Adolf: *See*—
Weber, Adolf; Strauss, Hans; and Bankel, Adolf, 4,693,180, Cl. 102-274.000.

Bannick, Mark A.; Divers, George A., III; and Jansons, Viktors, to Raychem Corporation. Purification of acid halides. 4,693,851, Cl. 260-544.00D.

Banning, Robert D.: *See*—
George, Robert D.; and Banning, Robert D., 4,693,709, Cl. 604-212.000.

Barclay, William; and Stanis, Alexander C., to Barclay, William. Paper cutting attachment. 4,693,150, Cl. 82-93.000.

Barger, Dwight F.: *See*—
Bartholic, David B.; and Barger, Dwight F., 4,693,809, Cl. 208-127.000.

Barker, James M.: *See*—
Luke, Robert R.; and Barker, James M., 4,693,308, Cl. 166-55.100.

Barnabe, Jean-Pierre: *See*—
Clerc, Michel M.; Mouhot, Frederic M.; and Barnabe, Jean-Pierre, 4,693,136, Cl. 74-492.000.

Barroero, Louis F. Self-closing hinge and isolation door installation. 4,692,963, Cl. 16-275.000.

Bartholic, David B.; and Barger, Dwight F., to Engelard Corporation. Hydrocarbon conversion process. 4,693,809, Cl. 208-127.000.

Bartholomew, Alan; Bauer, Harold; Berry, Loren E.; and Ediger, Glen, to Center Industries Corporation. Rivet tool having reversible anvil. 4,693,406, Cl. 227-63.000.

Bartlett, Bruce, to Crown International, Inc. Directional microphone with acoustic washer. 4,694,499, Cl. 381-155.000.

Barzaghi, Fernando: *See*—
Bianchi, Mario, deceased; and Barzaghi, Fernando, 4,694,019, Cl. 514-461.000.

Baschant, Robert: *See*—
Trumper, Reinhard; and Baschant, Robert, 4,693,661, Cl. 414-595.000.

Basf Aktiengesellschaft: *See*—
Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, 4,693,848, Cl. 260-402.000.
Colberg, Horst; and Hahn, Erwin, 4,694,075, Cl. 534-604.000.
Hoelderich, Wolfgang; Merger, Franz; Mross, Wolf D.; and Fischer, Rolf, 4,694,107, Cl. 568-310.000.
McKee, Graham E.; Ohlig, Hilmar; Reimann, Horst; and Sterzel, Hans-Josef, 4,694,042, Cl. 525-66.000.
Oehsen, Ubbo v.; Stecher, Karlheinz; Koehler, Waldemar; Mueller, Berthold; Brunnmueller, Fritz; and Schneider, Rolf, 4,693,877, Cl. 423-373.000.
Ziegler, Walter; Dietsche, Wolfram; Weiss, Stefan; Mueller, Richard; Hettche, Albert; Glaser, Klaus; and Vamvakaris, Christos, 4,693,909, Cl. 427-156.000.

Basic Measuring Instruments: *See*—
McEachern, Alexander; and Nitz, Frederic, 4,694,402 Cl. 364-487.000.

Bates, David, to Kendall Company, The. Bactericide valve on fluid collection bag. 4,693,712, Cl. 604-323.000.

Battelle Memorial Institute: *See*—
James, Brian R.; Li-Lee, Chung; Lilga, Michael A.; and Nelson, David A., 4,693,875, Cl. 423-243.000.

Bauer, Harold: *See*—
Bartholomew, Alan; Bauer, Harold; Berry, Loren E.; and Ediger, Glen, 4,693,406, Cl. 227-63.000.

Bauer, Kurt H.; Pritzwald-Stegmann, Bernd; and Luft, Werner, to Meggle Milchindustrie GmbH & Co. KG. Direct tabletting agent. 4,693,750, Cl. 106-163.100.

Bauer, Sigrid, to Ciba-Geigy Corporation. Photopolymerizable coating agent, a photopolymerizable material and its use. 4,693,961, Cl. 430-325.000.

Baugh, Benton F.; and Panicker, Narayana N., to Mobil Oil Corporation. Anti-rotation tubular connection for flowlines or the like. 4,693,498, Cl. 285-39.000.

Baxes, Gregory A., to American Television & Communications Corporation. Video scrambling system with line tilt correction. 4,694,335, Cl. 380-14.000.

Baxter, Raymond D. Modular water conditioning apparatus. 4,693,820, Cl. 210-232.000.

Bayer Aktiengesellschaft: *See*—
Fischer, Wolfgang; Klein, Gerhard; Hombach, Rudolph; and Kniege, Wilfried, 4,694,043, Cl. 525-127.000.
Hegasy, Ahmed; and Winter, Manfred, 4,693,892, Cl. 424-456.000.
Meier, Helmut-Martin; Dhein, Rolf; Winkel, Jens; Klein, Gerhard; and Kloker, Werner, 4,694,041, Cl. 525-25.000.
Mues, Peter; Buysch, Hans-Josef; Brassat, Bert; and Heine, Heinrich, 4,694,065, Cl. 528-371.000.
von Bonin, Wulf; Sattlegger, Hans; and Ebneth, Harold, 4,694,030, Cl. 523-179.000.

Bayha, Heiner; Kluge, Hermann; and Rachner, Horst, to SWF Auto Electric GmbH. System for supplying fuel including protection against electrolytic corrosion. 4,694,211, Cl. 310-71.000.

BBC Brown, Boveri & Company Limited: *See*—
Gloor, Urs; Hirth, Michael; and Kogelschatz, Ulrich, 4,693,870, Cl. 422-186.190.

Beale, Michael C.; and Kashy, David H., to Newport News Shipbuilding and Dry Dock Company. Muffler for gas inducting machinery generating low frequency noise. 4,693,339, Cl. 181-255.000.

Beall, Harry C. Medical apparatus method for assessing the severity of certain skin traumas. 4,693,255, Cl. 128-654.000.

Beardsley, Robert A., to Viskase Corporation. End closure for shirred casing sticks. 4,693,280, Cl. 138-118.100.

Bessom, James D., to Harris Corporation. Conductivity modulated semiconductor structure. 4,694,313, Cl. 357-23.400.

Bechtolsheimer, Hans-Heinrich: *See*—
Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, 4,693,848, Cl. 260-402.000.

Beck, Harold K.: *See*—
Ringgenberg, Paul D.; Newman, Daniel A.; and Beck, Harold K., 4,693,316, Cl. 166-355.000.

Beck, Jeffrey L.; and Campbell, David W., to Conoco Inc. Overflow for slurry tank. 4,693,826, Cl. 210-512.100.

Becker, Erwin; Ehrfeld, Wolfgang; and Hagmann, Peter, to Kernforschungszentrum Karlsruhe GmbH. Method for producing spinning nozzle plates. 4,693,791, Cl. 204-11.000.

Becker, Roland: *See*—
Newman, Vernon H.; and Becker, Roland, 4,693,472, Cl. 273-29.00A.

Becker, Wilfried: *See*—
Schwenzer, Michael; Eskam, Armin; Simon, Walter; and Becker, Wilfried, 4,693,434, Cl. 244-328.000.

Beckinger, Gunther; Egler, Gerhard; and Rambold, Thomas, to Siemens Aktiengesellschaft. Switching configuration for a telecommunications system in particular a PBX system with subscriber lines, trunk groups, and interface modules. 4,694,452, Cl. 370-58.000.

Beckman Instruments, Inc.: *See*—
Horrocks, Donald L., 4,694,176, Cl. 250-362.000.

Beckmann, Georg; Hillinger, Bruno; and Wolf, Bodo, to Waagner-Biro Aktiengesellschaft. Method for gasifying solid fuels. 4,693,729, Cl. 48-203.000.

Becton, Dickinson and Company: *See*—
Mansour, James D.; Schulte, Thomas H.; and Neece, Vernon R., 4,693,972, Cl. 435-34.000.
O'Connell, James P.; Hoke, Randal A.; and Mize, Patrick D., 4,693,970, Cl. 435-7.000.

Beer, Wilhelm, to General Motors Corporation. Arrangement for mounting an engine on the chassis of a motor vehicle. 4,693,217, Cl. 123-195.00A.

Beesley, Lawrence R.: *See*—
Wainwright, Ronald C.; and Beesley, Lawrence R., 4,693,153, Cl. 83-53.000.

Beil, Gerhard; Pichler, Alfred; Pachonik, Horst; and Plehnert, Kurt, to Siemens Aktiengesellschaft. Electrical isolation and leveling of patterned surfaces. 4,693,780, Cl. 156-643.000.

Beirne, Patrick R.: *See*—
Reesor, Gordon J.; Beirne, Patrick R.; and Styrna, Zbigniew B., 4,694,482, Cl. 379-27.000.

Bejczy, Antal K.; and Primus, Howard C., to California Institute of Technology. Linear array optical edge sensor. 4,694,153, Cl. 250-202.000.

Bell & Howell Company: *See*—
Svyatsky, Eduard; and Rabindran, K. George, 4,693,465, Cl. 271-274.000.

Bell Telephone Laboratories, Incorporated: *See*—
Torok, Gabor P.; and White, Andrew B., 4,694,472, Cl. 375-107.000.

Belmares-Sarabia, Armand; and Chayka, Stanley J., to Corporate Communications Consultants, Inc. Color correction system and method with scene-change detection. 4,694,329, Cl. 358-22.000.

Benchimol, Claude D.: *See*—
Tan, Siv C.; Nguyen, Tri H.; and Benchimol, Claude D., 4,694,399, Cl. 364-414.000.

Bendiberica S.A.: *See*—
Bacardit, Juan S., 4,693,123, Cl. 73-862.330.

Benecke, Herta: *See*—
Schwengers, Dieter; and Benecke, Herta, 4,693,974, Cl. 435-97.000.

Bentle, Larry A.; Mitchell, James W.; Storrs, Stephen B.; and Shimamoto, Grant T., to Monsanto Company. Method of somatotropin solubilization and naturation using dimethylsulfoxide. 4,694,073, Cl. 530-399.000.

Beretta, Pier G., to Fabrica D'Armi P. Beretta S.p.A. Control device for rapid firing particularly automatic weapons. 4,693,169, Cl. 89-129.020.

Berg, Lloyd; and Shanahan, Michael J. Separation of t-Amyl alcohol from isobutanol by extractive distillation. 4,693,787, Cl. 203-51.000.

Berg, Lloyd; and Shanahan, Michael J. Separation of t-amyl alcohol from isobutanol by extractive distillation. 4,693,788, Cl. 203-51.000.

Berg, Lloyd; and Yeh, An-I. Separation of isopropyl acetate from isopropanol by extractive distillation. 4,693,789, Cl. 203-51.000.

Berger, Karl-Heinz, to Bochumer Eisenhutte Heintzmann GmbH & Co KG. Method of controlling hydraulically actuatable arrangement in underground mining. 4,693,640, Cl. 405-294.000.

Bergstedt, Gar A., to Tektronix, Inc. Apparatus and method for modifying displayed color images. 4,694,286, Cl. 340-703.000.

Bergwitz-Larsen, Carl-Aage; and Osterlund, Rolf G. L., to KabiVitrum AB. Novel pharmaceutical composition. 4,693,997, Cl. 514-54.000.

Beriger Ernst, to Ciba-Geigy Corporation. Nematicidal compositions. 4,694,014, Cl. 514-363.000.

Berlex Laboratories, Inc.: *See*—
Malpass, Jack W., 4,693,371, Cl. 206-538.000.

Bernier, Donald R.: *See*—
Weintraub, Marvin H.; Bernier, Donald R.; and Cameron, Larry, 4,693,419, Cl. 239-63.000.

Bernocco, Giovanni, to TEMSIR S.r.l. Electrically controlled motorcycle stand. 4,693,488, Cl. 280-293.000.

Berry, Loren E.: *See*—
Bartholomew, Alan; Bauer, Harold; Berry, Loren E.; and Ediger, Glen, 4,693,406, Cl. 227-63.000.

Bessho, Hironori: *See*—
Chujo, Yoshiki; Kayanuma, Nobuaki; Bessho, Hironori; Masui, Takatoshi; Nagai, Toshinari; Katsuno, Toshiyasu; and Tanahashi, Toshio, 4,693,076, Cl. 60-274.000.

Bett, John A. S.: *See*—
Setzer, Herbert J.; Karavolis, Sam; and Bett, John A. S., 4,693,882, Cl. 423-652.000.

Bettini, John E., to Illinois Tool Works Inc. Self-drilling, self-tapping fastener. 4,693,654, Cl. 411-387.000.

Betz Laboratories, Inc.: *See*—
Feldman, Nancy A., 4,693,866, Cl. 422-13.000.

Beuzard, Yves: *See*—
Sebille, Bernard; Beuzard, Yves; and Demarne, Henri, 4,694,015, Cl. 514-375.000.

Beyer, Karl-Heinz: *See*—
Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, 4,693,848, Cl. 260-402.000.

Beyer, Otto: *See*—
Kirst, Bertold; Beyer, Otto; and Lipp, Wolfgang, 4,693,168, Cl. 89-41.110.

Bianchi, Mario, deceased (by de Carli, Elsa, Silvana Bianchi and Giovanni Bianchi, Legal Representatives); and Barzaghi, Fernando, to Roussel UCLAF. Therapeutica compositions containing derivatives of, acrylic acid having an oxygen-containing heterocycle, therapeutic treatment therewith and new compounds. 4,694,019, Cl. 514-461.000.

Biard, Jacques, to Fenzy S.A. Coupling connectors for respirator masks. 4,693,242, Cl. 128-204.260.

BICC Public Limited Company: *See*—
Cane, Michael R., 4,693,540, Cl. 439-198.000.

Bicknell, William H.: *See*—
Steigerwald, Robert L.; Routh, Kevin C.; Claydon, Glenn S.; and Bicknell, William H., 4,694,384, Cl. 363-17.000.

Bieber, Oswald; Haas, Erich; Henglein, Rudolf; and Richter, Bernd, to Kraftwerk Union Aktiengesellschaft. Remotely operable tool for setting plugs into heat exchanger tubes. 4,693,277, Cl. 138-89.000.

Bilimoria, Bomi M.; Lewis, Herbert I.; Cook, Jerry A.; Turner, Ralph E.; and Garner, Robert H., to E.C.C. America Inc. Method for improving handleability of calcined kaolin clay products. 4,693,427, Cl. 241-23.000.

Billarant, Patrick J.; and Queval, Bruno. Fastening tape designed to be attached to a molded article during molding, and its attaching method. 4,693,921, Cl. 428-100.000.

Billard, Georges; Blanchard, Francoise; Klemenz, Willy; Combet, Roger; and Richard, Daniel, to Vetrotex Saint Gobain. Device and process for simultaneously winding several separate fibers on a rotating support. 4,693,429, Cl. 242-18.00G.

Biogen N.V.: *See*—
Buell, Gary N., 4,693,973, Cl. 435-68.000.

Bisbing, Robert H., to Southco, Inc. Latch and hinge assembly. 4,693,187, Cl. 108-69.000.

Bisbing, Robert H., to Southco, Inc. Lever latch. 4,693,503, Cl. 292-210.000.

Bischoff, Peter G.; Rauch, David J.; Retort, Vincent D.; and Osborne, John R., to Read-Rite Corporation. Thin film magnetic head with three superimposed coils. 4,694,368, Cl. 360-126.000.

Bjornson, Geir; Klendworth, Douglas D.; Gardner, Lloyd E.; and Farha, Floyd E., Jr., to Phillips Petroleum Company. Hydrotreating catalyst composition. 4,693,991, Cl. 502-220.000.

Black & Decker Inc.: *See*—
Bone, Daniel, 4,693,009, Cl. 30-392.000.

Black, Kenneth R. Animal restraint apparatus and method. 4,693,212, Cl. 119-103.000.

Black, Randy D.; and Tomczak, Walter F. Protective helmet, chin cup, and face guard. 4,692,947, Cl. 2-421.000.

Blackburn, Ronald, to Sundstrand Corporation. Method and apparatus for starting a gas turbine engine. 4,693,073, Cl. 60-39.020.

Blackford, William L.; and Zakharin, Greg, to Martin Engineering Company. Piston vibrator. 4,693,732, Cl. 55-112.000.

Blackman, Peter M. Thermally powered engine utilizing thermally powered valves. 4,693,090, Cl. 62-116.000.

Blanchard, Francoise: *See*—
Billard, Georges; Blanchard, Francoise; Klemenz, Willy; Combet, Roger; and Richard, Daniel, 4,693,429, Cl. 242-18.00G.

Blanchard, Pierre, to Thomson-CSF. Method of obtaining a diode whose contact tapping is self aligned with a gate. 4,692,995, Cl. 437-41.000.

Blanco, Carlos; Asam, Adolf R.; and Smith, John C., to U.S. Holding Company, Inc. Dielectric strength elements for loose tube optical fiber cable. 4,693,551, Cl. 350-96.230.

Blatherwick, William J.; Hamilton, Leslie; Holewinski, Robert D.; Shen, Virginia A.; Kapec, Jeffrey; and Tanaka, Kazuna, to Johnson & Johnson Dental Products Company. Ratchet type dispenser for dental materials. 4,693,684, Cl. 433-90.000.

Bleier, Waldemar; Lutze, Theodor; and Stallforth, Harald, to Aesculap-Werke AG. Clip for the occlusion of an oviduct or vas deferens. 4,693,251, Cl. 128-346.000.

Blesser, Barry, to Pencept, Inc. Digitizing tablet system including a tablet having a grid structure made of two orthogonal sets of parallel uniformly sized and spaced U shaped loops of conductive material. 4,694,124, Cl. 178-19.000.

Blesser, Barry A. Digital data communicating. 4,694,471, Cl. 375-45.000.

Bletz, Walter; and Magel, Rolf, to Ernst Leitz Wetzlar GmbH. Circuit arrangement to ascertain and indicate that a luminous density limit condition is exceeded. 4,694,155, Cl. 250-214.00R.

Blohm & Voss AG: *See*—
Friederichs, Karl-Heinz; and Twiefel, Gunther, 4,693,665, Cl. 414-744.00R.

Bloom, Frank: *See*—
Gowda, Hanumaiah L.; Cheever, Charles J.; and Bloom, Frank, 4,694,213, Cl. 310-90.000.

Blum, Dietmar, to Julius Blum Gesellschaft m.b.H. Drilling and mounting machine for furniture production. 4,692,973, Cl. 29-33.00K.

Blumenkranz, Robert M.; and Gibbons, Mark A., to General Instrument Corporation. Method and system of enhancing performance of feedforward amplifiers. 4,694,258, Cl. 330-2.000.

Board of Regents, The University of Texas System: *See*—
Serwer, Philip, 4,693,804, Cl. 204-182.100.

Bochi, Hiroshi; Ueda, Kenji; and Konishi, Satoshi, to Ishida Scales Mfg. Co., Ltd. Automatic combinatorial weighting apparatus. 4,693,355, Cl. 193-2.00R.

Bochumer Eisenhutte Heintzmann GmbH & Co KG: *See*—
Berger, Karl-Heinz, 4,693,640, Cl. 405-294.000.

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Bock, Jan: *See*—
Siano, Donald B.; and Bock, Jan, 4,694,058, Cl. 526-307.200.

Bodine, Albert G. Sonic drill employing orbiting crank mechanism. 4,693,325, Cl. 175-55.000.

Bodine, Albert G. Cycloidal earth cutting system with rocker-type nutating action. 4,693,326, Cl. 175-55.000.

BOE Limited: *See*—
Quazi, Fazle S., 4,693,805, Cl. 204-192.220. ,

Boecker, Wolfgang D. G.; and Korzekwa, Tadeusz M., to Kennecott Corporation. Single phase silicon carbide refractory. 4,693,988, Cl. 501-89.000.

Boehringer Ingelheim KG: *See*—
Losel, Walter; Roos, Otto; and Schnorrenberger, Gerd, 4,694,085, Cl. 546-65.000.

Boehringer Mannheim GmbH: *See*—
Stetter, Karl O.; and Schmitt, Rudiger, 4,693,978, Cl. 435-199.000.
Stetter, Karl O.; and Schmitt, Rudiger, 4,693,979, Cl. 435-199.000.
Stetter, Karl O.; Schmitt, Rudiger; and Laue, Frank, 4,693,980, Cl. 435-199.000.

Boeing Company, The: *See*—
Burns, Robert A.; and VanWyk, Jan W., 4,694,038, Cl. 524-590.000.
Cross, Dan A., 4,692,974, Cl. 29-33.00M.
Kowalski, Joseph C.; Mottaz, Donald A.; and Cole, Berton A., 4,693,926, Cl. 428-204.000.
VonVolkli, Arthur D., 4,693,678, Cl. 425-405.00R.

Boffardi, Bennett P., to Calgon Corporation. Use of carboxylic acid/-sulfonic acid copolymers as aluminum ion stabilizers. 4,693,829, Cl. 210-697.000.

Bohley, Thomas K.: *See*—
Whiteside, Laura; and Bohley, Thomas K., 4,694,244, Cl. 324-121.00R.

Bohm, August; Lentz, Gerhard; and Wilkens, Gunter, to Oxytechnik. Process and device for handling workpieces, especially for the thermal separation of profiles with a cutting torch. 4,693,761, Cl. 148-9.00R.

Boix-Vives, Laurent: *See*—
Salas, Joseph; and Boix-Vives, Laurent, 4,693,020, Cl. 36-117.000.

Bolte, Georg, to Schmalbach-Lubeca AG. Method of decorating and inhibiting corrosion of metallic articles. 4,693,801, Cl. 204-180.200.

Bom, Cornelis J. G.: *See*—
van der Lely, Ir E.; and Bom, Cornelis J. G., 4,693,062, Cl. 56-13.600.

Bommer, Jerry C.; and Burnham, Bruce F., to Nippon Petrochemicals Co., Ltd. Tetrapyrrole therapeutic agents. 4,693,885, Cl. 424-2.000.

Bonar Rosedale Plastics Ltd.: *See*—
Hughes, Larry R.; Dorsey, Michael L.; and Wensley, David, 4,693,386, Cl. 220-1.500.

Bond, Bruce E.; and Harrold, William J., to Raytheon Company. Magnetic drum separator. 4,693,812, Cl. 209-224.000.

Bone, Daniel, to Black & Decker Inc. Scroller jig saw. 4,693,009, Cl. 30-392.000.

Bonenberger, Kenneth E., to Litton Systems, Inc. Rolling loop twist capsule. 4,693,527, Cl. 439-13.000.

Booth, Peter A. Combined toothbrush and toothpaste dispenser. 4,693,622, Cl. 401-191.000.

Borg-Warner Automotive, Inc.: *See*—
Amuda, Suarawu O., 4,694,127, Cl. 200-83.00P.
Born, Peter. Apparatus for wrapping stacked goods. 4,693,060, Cl. 53-588.000.
Borromeo, Lucio, to 3 T S.p.A. Device for fixing the saddle of a bicycle to a saddle pillar and for adjusting the inclination of the saddle. 4,693,627, Cl. 403-24.000.
Bos, Willem: *See*—
Bourne, Richard C.; Fanciullo, Martin; and Bos, Willem, 4,693,089, Cl. 62-79.000.
Bosch, Walter: *See*—
Arnold, Herbert; Bosch, Walter; Horbelt, Michael; Maisch, Wolfgang; Nusser, Hermann; Peters, Klaus-Jurgen; Werner, Peter; and Willke, Clemens, 4,693,111, Cl. 73-118.100.
Boschert, Incorporated: *See*—
Small, Kenneth T., 4,694,389, Cl. 363-132.000.
Bottas, Michael J.: *See*—
Burk, Jeffrey L.; Bottas, Michael J.; Pielemeier, John W.; and Mueller, Dale E., 4,693,095, Cl. 68-134.000.
Bourne, Richard C.; Fanciullo, Martin; and Bos, Willem, to Phenix Heat Pump Systems, Inc. Three function heat pump system. 4,693,089, Cl. 62-79.000.
Bowe, Michael J.; Oruh, Samuel N.; and Singh, Jaswant, to United Kingdom Atomic Energy Authority. Fluidic contactors. 4,693,822, Cl. 210-255.000.
Bowen, James H.: *See*—
Porter, David R.; Bowen, James H.; and Holland, John M., 4,694,504, Cl. 455-608.000.
Bowles, James B.; White, Marshall, Jr.; Puentener, Alois; Adam, Jean-Marie; and Loew, Peter, to Ciba-Geigy Corporation. Process for dyeing synthetic polyamide materials with fibre-reactive anthraquinone dyes. 4,693,727, Cl. 8-549.000.
Boyd, Richard M., to Quadion Corporation. Multi-lobed rectangular sealing ring. 4,693,343, Cl. 188-322.170.
Boyle, David E.: *See*—
Tower, Stephen N.; Braun, Howard E.; Boyle, David E.; and Salton, Robert B., 4,693,862, Cl. 376-209.000.
Bradbury, Colin; and Douglas, George H., to Office Automation Systems, Inc. Laser printer controller data alignment device. 4,694,405, Cl. 364-518.000.
Brandl, Hans; and Liegl, Werner, to Siemens Aktiengesellschaft. Circuit for electronic speech synthesis. 4,694,496, Cl. 381-51.000.
Brassard, Pierre: *See*—
Leveille, Serge; Cormier, Jacqueline; Cormier, Ginette; and Brassard, Pierre, 4,694,284, Cl. 340-574.000.
Brassat, Bert: *See*—
Mues, Peter; Buysch, Hans-Josef; Brassat, Bert; and Heine, Heinrich, 4,694,065, Cl. 528-371.000.
Brattsand, Ralph L.: *See*—
Axelsson, Bengt I.; Brattsand, Ralph L.; Dahlback, Carl M. O.; Kallstrom, Leif A.; and Trofast, Jan W., 4,693,999, Cl. 514-174.000.
Braun, Howard E.: *See*—
Tower, Stephen N.; Braun, Howard E.; Boyle, David E.; and Salton, Robert B., 4,693,862, Cl. 376-209.000.
Breckwoldt, Robert G., to Tripar Incorporated. Smoking material. 4,693,266, Cl. 131-359.000.
Breezer, Harlan W.: *See*—
Dresen, William L.; Price, William F.; Emery, Phillip L.; Breezer, Harlan W.; and Holmes, Robert R., 4,693,507, Cl. 296-39.00R.
Bremer, Roger E.; Anthony, Charles, Jr.; and Chappel, Raymond M. Long-life biomedical transcutaneous drug application device and method of transcutaneous application of drugs. 4,693,711, Cl. 604-306.000.
Brenholt, David L.; Crane, Stephen M.; Fischer, Paul M.; and Mattson, Kenneth V., to Donaldson Company, Inc. Robot with articulated arm. 4,693,663, Cl. 414-735.000.
Brenner, Bernhard: *See*—
Podolsky, Richard J.; Baker, Gordon R.; and Brenner, Bernhard, 4,693,606, Cl. 356-355.000.
Brent, George I., to Tallgrass Technologies, Inc. Mechanism for moving recording heads across computer tapes. 4,694,367, Cl. 360-106.000.
Brett, Dennis A.; and Runshe, Clay R., to Techserve Engineering Corp. Non-electrical solvent recovery distillation apparatus. 4,693,786, Cl. 202-83.000.
Bretz, Philip E.; Petit, Jocelyn I.; Sawtell, Ralph R.; and Vasudevan, Asuri K., to Aluminum Company of America. Alloy having improved fatigue crack growth resistance. 4,693,747, Cl. 75-249.000.
Breuninger, Manfred; and Schmidt, Dieter, to Hoffmann-La Roche Inc. Glycerol ether phosphatides. 4,694,084, Cl. 546-25.000.
Brewster, Phillip W.: *See*—
Varma, Vijaya K.; Winans, Esther D.; O'Halloran, Rosemary; and Brewster, Phillip W., 4,693,838, Cl. 252-51.50R.
Brieger, Emmet F.: *See*—
Edwards, A. Glen; Wesson, David S.; and Brieger, Emmet F., 4,693,317, Cl. 166-378.000.
Briish Telecommunications public limited company: *See*—
Adams, Peter F.; and Cowan, Colin F. N., 4,694,451, Cl. 370-32.100.
Brisson, Alfred G.; and Nowacki, Christopher, to Trutek Research, Inc. Triggering circuit. 4,693,247, Cl. 128-328.000.
Brisson, Glenn R.: *See*—
Hughes, Robert W.; Brisson, Robert H.; and Brisson, Glenn R., 4,693,138, Cl. 74-567.000.
Brisson, Robert H.: *See*—
Hughes, Robert W.; Brisson, Robert H.; and Brisson, Glenn R., 4,693,138, Cl. 74-567.000.
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Crast, Leonard B., Jr., 4,694,079, Cl. 540-215.000.
British Aeroapace PLC: *See*—
Harvey, Charles P., 4,693,172, Cl. 98-2.010.
British-American Tobacco Company Limited: *See*—
Hedge, Roger W., 4,693,264, Cl. 131-296.000.
British Gas Corporation: *See*—
Wayman, Malcolm; and Mood, Geoffrey I., 4,693,404, Cl. 225-103.000.
British Nuclear Fuels Plc: *See*—
Eccles, Harry; and Fell, Stephen A., 4,693,795, Cl. 204-94.000.
British Petroleum Company p.l.c., The: *See*—
Alper, Howard; and Smith, David J. H., 4,694,097, Cl. 560-24.000.
Gerrard, Donald L.; Preedy, John E.; and Williams, Kenneth P. J., 4,693,377, Cl. 209-579.000.
Brooks, Hannah: *See*—
Houghton, Alan N.; Brooks, Hannah; Cote, Richard J.; Oettgen, Herbert F.; and Old, Lloyd J., 4,693,966, Cl. 435-7.000.
Brown, David; Hargreaves, Rodney B.; McLoughlin, Bernard J.; and Mills, Stuart D., to Imperial Chemical Industries PLC. 5-phenyl-3H,6H-1,3,4-oxadiazine-2-ones in treatment of heart failure and hypertension. 4,694,005, Cl. 514-234.000.
Brown, Jerry W. Removable water guard for sliding patio doors. 4,692,961, Cl. 16-95.00R.
Brown, Keith E., to Kinetico. Inc. Water treatment apparatus. 4,693,814, Cl. 210-88.000.
Brown, Paul S., Jr.: *See*—
Hollenbeak, Keith H.; and Brown, Paul S., Jr., 4,693,639, Cl. 405-263.000.
Brown, Raymond C., to Superior Industries International, Inc. Automotive vehicle wheel with non-supporting spokes. 4,693,520, Cl. 301-37.0SS.
Brown, Thomas H.; and Durant, Graham J., to Smith Kline & French Laboratories Limited. Chemical compounds. 4,694,008, Cl. 514-269.000.
Brown, Vincent B.; and McGrew, Sherman W., to Methode Electronics, Inc. Crimp type fiber optic connector. 4,693,550, Cl. 350-96.200.
Bruck, Gerald J.: *See*—
Kasner, William H.; Bruck, Gerald J.; Miller, Richard A.; and Toth, Vincent A., 4,694,136, Cl. 219-121.0LD.
Bruinsma, Robert F., to Datron Systems, Inc. Fastener for joining panels to each other. 4,693,629, Cl. 403-170.000.
Bruker Medizintechnik G.m.b.H.: *See*—
Post, Hans; Ratzel, Dieter; Brunner, Peter; and Knuttel, Bertold, 4,694,249, Cl. 324-309.000.
Brunner, Hans-Georg, to Ciba-Geigy Corporation. Cyclohexanedionecarboxylic acid derivatives with herbicidal and plant growth regulating properties. 4,693,745, Cl. 71-94.000.
Brunner, Peter: *See*—
Post, Hans; Ratzel, Dieter; Brunner, Peter; and Knuttel, Bertold, 4,694,249, Cl. 324-309.000.
Brunnmueller, Fritz: *See*—
Oehsen, Ubbo v.; Stecher, Karlheinz; Koehler, Waldemar; Mueller, Berthold; Brunnmueller, Fritz; and Schneider, Rolf, 4,693,877, Cl. 423-373.000.
Bucher, Hans R.; and Hodd, Donald E., to Xedar Corporation. Pyroelectric camera signal processing having pedestal signal level compensation. 4,694,334, Cl. 358-113.000.
Buck, Gordon H. Inflated balloon tire for toy vehicles. 4,693,696, Cl. 446-224.000.
Buck, Manfred; Fehrle, Siegfried; Holzel, Martin; Kabatnik, Wilfried; Schmid, Wolfgang; and Wanner, Karl, to Robert Bosch GmbH. Power impact device, particularly for fasteners. 4,693,407, Cl. 227-109.000.
Buckley, Alan: *See*—
DeMartino, Ronald N.; Yoon, Hyun-Nam; Stamatoff, James B.; and Buckley, Alan, 4,694,066, Cl. 528-373.000.
Buddy L Corporation: *See*—
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham A., 4,693,693, Cl. 446-6.000.
Buechele, Juergen W.; and Fisher, Guenter, to G & F Precision, Inc. Universal joint maker. 4,693,288, Cl. 144-87.000.
Buehler Ltd.: *See*—
Doyle, Ralph R., 4,693,035, Cl. 51-125.000.
Buell, Gary N., to Biogen N.V. DNA sequences, recombinant DNA molecules and processes for producing bovine growth hormone-like polypeptides in high yield. 4,693,973, Cl. 435-68.000.
Buller, Joseph S., to Santa Barbara Research Center. Thermal damper for infrared detector. 4,694,175, Cl. 250-352.000.
Buma, Shuuichi; Onuma, Toshio; Ohashi, Kaoru; and Itou, Masami, to Toyota Jidosha Kabushiki Kaisha. Suspension controller. 4,693,494, Cl. 280-707.000.
Bundgaard, Hans; and Falch, Erik, to A/S GEA. Acyl- or acyloxymethyl-allopurinol prodrugs. 4,694,006, Cl. 514-258.000.
Buras, Sharon Y. Conduit system for directly administering topical anaesthesia to blocked laryngeal-tracheal areas. 4,693,243, Cl. 128-207.150.
Burghard, Andre: *See*—
Rezek, Edward A.; and Burghard, Andre, 4,694,311, Cl. 357-17.000.
Burgio, Antonio, to Fiat Auto S.P.A. Internal combustion engine with direct fuel injection. 4,693,219, Cl. 123-276.000.

Burgoyne, William F.: *See*—
Dixon, Dale D.; and Burgoyne, William F., 4,693,837, Cl. 252-50.000.

Burk, Jeffrey L.; Bottas, Michael J.; Pielemeier, John W.; and Mueller, Dale E., to Whirlpool Corporation. Clothes mover agitator for automatic washer. 4,693,095, Cl. 68-134.000.

Burke, Ken V.; Jamieson, Jon V.; and Keller, Ernie, to Mountain Computer, Inc. Diskette transport. 4,693,659, Cl. 414-131.000.

Burlington Industries, Inc.: *See*—
Morrison, Elbert F., 4,693,071, Cl. 57-289.000.

Burnett, Sibley C.; Purcell, John R.; and Horner, M. Harlan, to GA Technologies Inc. Magnet system and method of its manufacture. 4,694,269, Cl. 335-216.000.

Burnham, Bruce F.: *See*—
Bommer, Jerry C.; and Burnham, Bruce F., 4,693,885, Cl. 424-2.000.

Burnham, Robert D.; Paoli, Thomas L.; Scifres, Donald R.; and Streifer, William, to Xerox Corporation. Hybrid gain/index guided semiconductor lasers and array lasers. 4,694,459, Cl. 372-45.000.

Burns, Robert A.; and VanWyk, Jan W., to Boeing Company, The. Low friction, low wear coating and paint for rubber. 4,694,038, Cl. 524-590.000.

Burroughs Wellcome: *See*—
Campbell, David A., 4,693,893, Cl. 424-89.000.

Burrows, James L., to Sanders Associates, Inc. Simulation apparatus and method. 4,694,411, Cl. 364-578.000.

Buschmann, Gunther: *See*—
Wupper, Hans; and Buschmann, Gunther, 4,693,522, Cl. 303-105.000.

Buschmeier, Dieter, to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co. Gearlike, abrasive precision working tool, a method for dressing of such a tool and a dressing tool for dressing the tool. 4,693,231, Cl. 125-116.00D.

Butler, Jerry F.: *See*—
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,693,890, Cl. 424-78.000.

Butler Newall Machine Tool Company Limited: *See*—
Shackleton, Raymond T., 4,693,147, Cl. 82-40.00A.

Buxton, Clifford A.; Higgins, David C.; and Volesky, Gary A., to Square D. Company. Drive mechanism for drawout high amperage multi-pole circuit breaker. 4,693,132, Cl. 74-425.000.

Buyofsky, Conrad C.; and Kennette, John W., to Chicopee. Light weight entangled non-woven fabric having excellent machine direction and cross direction strength and process for making the same. 4,693,922, Cl. 428-134.000.

Buysch, Hans-Josef: *See*—
Mues, Peter; Buysch, Hans-Josef; Brassat, Bert; and Heine, Heinrich, 4,694,065, Cl. 528-371.000.

Buzzi, Riccardo, to Matalplast S.r.l. Mechanism for actuating the hook and claw and for stitch setting in portable sewing machine. 4,693,194, Cl. 112-199.000.

C. R. Bard, Inc.: *See*—
Franko, Zenon Z., 4,693,719, Cl. 623-11.000.

C. Van der Lely N.V.: *See*—
van der Lely, Ir E.; and Bom, Cornelis J. G., 4,693,062, Cl. 56-13.600.

Caflisch, Jerry A.; and Ockuly, John D., to Pako Corporation. Photosensitive sheet dryer. 4,693,014, Cl. 34-23.000.

Caldwell, James M.: *See*—
Adamson, Fletcher D.; and Caldwell, James M., 4,693,460, Cl. 271-10.000.

Calgon Corporation: *See*—
Boffardi, Bennett P., 4,693,829, Cl. 210-697.000.

California Institute of Technology: *See*—
Bejczy, Antal K.; and Primus, Howard C., 4,694,153, Cl. 250-202.000.

Callahan, David T.; and Dobyns, David W., to Allen-Morrison, Inc. Changeable message outdoor advertising sign. 4,693,026, Cl. 40-576.000.

Calviello, Joseph A., to Eaton Corporation. Method for fabricating MOMOM tunnel emission transistor. 4,692,997, Cl. 437-238.000.

Camacho Salvador L., to Plasma Energy Corporation. Plasma arc heating apparatus and method. 4,694,464, Cl. 373-22.000.

Cameron, Allan, Sr. Apparatus for conducting hot gases from an exhaust pipe. 4,693,421, Cl. 239-129.000.

Cameron Iron Works, Inc.: *See*—
Pettus, Ronald G.; and Schmitz, Thomas R., 4,693,497, Cl. 285-12.000.

Cameron, Larry: *See*—
Weintraub, Marvin H.; Bernier, Donald R.; and Cameron, Larry, 4,693,419, Cl. 239-63.000.

Camp, Ronnie W.: *See*—
Killip, Graham R.; Camp, Ronnie W.; and Orr, Clyde, Jr., 4,693,124, Cl. 73-863.110.

Campbell, Bonnie J.: *See*—
Cunningham, James L.; and Campbell, Bonnie J., 4,692,978, Cl. 29-157.30A.

Campbell, David A., to Burroughs Wellcome. Vaccines for equine influenza. 4,693,893, Cl. 424-89.000.

Campbell, David W.: *See*—
Beck, Jeffrey L.; and Campbell, David W., 4,693,826, Cl. 210-512.100.

Campbell, John, to Cosworth Research and Development Limited. Casting of metal articles. 4,693,292, Cl. 164-34.000.

Campbell, Leonard. Lubricating system for a weaving machine. 4,693,282, Cl. 139-1.00R.

Campolo, Steve, to Leviton Manufacturing Company, Inc. Thermal sensor for a lighting fixture. 4,694,223, Cl. 315-118.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Sewards, Alan, 4,694,297, Cl. 342-45.000.

Cane, Michael R., to BICC Public Limited Company. Pressure regulating devices. 4,693,540, Cl. 439-198.000.

Cannan, Terrance: *See*—
Chirchirillo, Michael T.; and Cannan, Terrance, 4,693,889, Cl. 424-83.000.

Canon Denshi Kabushiki Kaishsa: *See*—
Ogawa, Tetsu, 4,694,421, Cl. 364-900.000.

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Hanagata, Takayoshi, 4,693,618, Cl. 400-120.000.
Hanamori, Ryoichi; Nakashima, Shigeo; and Yamamoto, Hiroshi, 4,693,580, Cl. 354-271.100.
Ikeda, Masami; Matsuda, Hiroto; Takahashi, Hiroto; and Shohji, Tatsumi, 4,694,306, Cl. 346-140.00R.
Ina, Kenzoh; Otani, Masatoshi; and Mishima, Kenichi, 4,694,352, Cl. 358-257.000.
Kawamura, Masaharu; and Hiramatsu, Akira, 4,693,582, Cl. 354-403.000.
Kishi, Hiroyoshi; and Matsushima, Masaaki, 4,693,943, Cl. 428-678.000.
Konno, Tatsuo, 4,693,578, Cl. 354-173.100.
Matsuda, Hiroshi; Haruta, Masahiro; Hirai, Yutaka; Nishimura, Yukuo; Eguchi, Ken; and Nakagiri, Takashi, 4,693,915, Cl. 427-256.000.
Ohnuki, Ichiro; Aihara, Yoshihiko; Tosaka, Yoichi; and Eguchi, Masaharu, 4,693,574, Cl. 354-21.000.
Onoda, Ruri; Kuroki, Yoichi; and Nakamura, Gen, 4,694,186, Cl. 250-578.000.
Ozawa, Kunitaka; Ayata, Naoki; Suzuki, Hidetoshi; Saito, Seiji; and Koumura, Noboru, 4,694,502, Cl. 382-17.000.
Shigenobu, Michio; and Saito, Takashi, 4,693,587, Cl. 355-3.0FU.
Shiomi, Yasuhiko; and Suzuki, Ryoichi, 4,693,597, Cl. 356-1.000.
Takasu, Yoshio; Oguchi, Yoshihiro; and Katagiri, Kazuharu, 4,693,951, Cl. 430-31.000.
Toganoh, Shigeo; Matsufuji, Yohji; and Ichihashi, Hiroo, 4,694,307, Cl. 346-140.00R.
Toyama, Masamichi; and Kozuki, Susumu, 4,694,149, Cl. 250-201.000.
Tsunoi, Haruo, 4,693,548, Cl. 350-96.130.

Cantwell, Robert H., to Raytheon Company. Method and apparatus for determining the magnitude of a square root of a sum of squared value using vernier addressing. 4,694,417, Cl. 364-752.000.

Capasso, Federico; and Tsang, Won-Tien, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Sawtooth photodetector. 4,694,318, Cl. 357-30.000.

Card, Joseph L.; and Card, Roy T. Knife holder for tufting machine. 4,693,191, Cl. 112-80.600.

Card, Roy T.: *See*—
Card, Joseph L.; and Card, Roy T., 4,693,191, Cl. 112-80.600.

Cardinal Biological, Ltd.: *See*—
Hullah, William, 4,693,901, Cl. 426-330.600.

Carickhoff, Richard C.; Hemdal, Hakan O.; and Schultz, Alvin L., to Laser Magnetic Storage International Company. Data tracking clock recovery system having media speed variation compensation. 4,694,259, Cl. 331-1.00A.

Carl Hamel Spinn-& Zwirnmaschine AG: *See*—
Imhof, Christian; and Kempf, Gerhard, 4,693,069, Cl. 57-59.000.

Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co.: *See*—
Buschmeier, Dieter, 4,693,231, Cl. 125-116.00D.

Carl-Zeiss-Stiftung: *See*—
Schwarz, Jurgen, 4,694,290, Cl. 340-815.210.

Carlqvist, Stig G., to Stig G. Carlqvist Motor Consultant, (C.M.C.) Aktiebolag. Method for supplying heat to an engine for external heat supply by intermittent combustion, and engine for carrying out the method. 4,693,082, Cl. 60-517.000.

Carlson, Lee G.: *See*—
Terrien, Conrad; and Carlson, Lee G., 4,693,818, Cl. 210-189.000.

Carnes, Gerald L.: *See*—
Shanks, Ernest R.; and Carnes, Gerald L., 4,693,340, Cl. 187-52.00R.

Carnes, Robert E.: *See*—
Del Corso, Gregory J.; Carnes, Robert E.; and Esposito, David, 4,693,863, Cl. 419-13.000.

Carpenter, Clayton A.: *See*—
Kurlytis, Paul C.; and Carpenter, Clayton A., 4,693,468, Cl. 272-73.000.

Carpenter Technology Corporation: *See*—
Del Corso, Gregory J.; Carnes, Robert E.; and Esposito, David, 4,693,863, Cl. 419-13.000.

Carrier Corporation: *See*—
O'Mara, Raymond D.; and Shapiro, Ian M., 4,693,091, Cl. 62-272.000.

Carroll, David L.: *See*—
Tavss, Edward A.; Santalucia, John; and Carroll, David L., 4,693,395, Cl. 222-107.000.

Carroll, Davis L.: *See*—
Tavss, Edward A.; Temin, Samuel; Santalucia, John; and Carroll, Davis L., 4,693,396, Cl. 222-107.000.

Carroll, Michael W.; and Harwood, Michael E., to North American Agricultural, Inc. Method and apparatus for forming an arcuate sheet metal seam. 4,692,980, Cl. 29-243.520.

Carson, David M.; and Weyant, Oakley L., Jr., to Du Pont de Nemours, E. I., and Company. Rotor having frangible projections thereon. 4,693,702, Cl. 494-61.000.

Carter, Walter H.; and Srivastava, Vinai K., to Millmaster Onyx Group, Inc. Enzymatically-trested guar gums. 4,693,982, Cl. 435-274.000.

Carvalho, Paul A., to United Technologies Corporation. Two level oil dam. 4,693,672, Cl. 416-174.000.

Casco Products Corporation: *See*—
Lupoli, Peter J.; and Mattis, Donald J., 4,694,128, Cl. 200-84.00R.

Casey, Frank; and Downing, Paul A., to General Engineering Radcliffe Limited. Vacuum coating apparatus. 4,693,803, Cl. 204-298.000.

Caskey, Kenneth D., to Halliburton Company. Wireline set/tubing retrievable bridge plug. 4,693,309, Cl. 166-123.000.

Caster, Wayne L., to Caster, Wayne L. Art production method utilizing cast coated paper for preparation of camera-ready art. 4,693,768, Cl. 156-62.000.

Cavedo, Robert P., to Singer Company, The. Depth of cut adjusting mechanism. 4,693,648, Cl. 409-178.000.

Cedar, Larry. Aerobic exercise device. 4,693,469, Cl. 272-74.000.

Celanese Corporation: *See*—
Choe, Eui W., 4,694,048, Cl. 525-376.000.
DeMartino, Ronald N.; Yoon, Hyun-Nam; Stamatoff, James B.; and Buckley, Alan, 4,694,066, Cl. 528-373.000.
Foley, Paul, 4,693,914, Cl. 427-255.000.
Gupta, Balaram B. G., 4,694,111, Cl. 568-662.000.
Sansone, Michael J., 4,693,824, Cl. 210-500.280.
Trouw, Norman S., 4,693,825, Cl. 210-500.280.

Cembruch, Bronislau J.; and Werner, Walter M., to AMP Incorporated. Grounding connector. 4,693,688, Cl. 439-877.000.

Center Industries Corporation: *See*—
Bartholomew, Alan; Bauer, Harold; Berry, Loren E.; and Ediger, Glen, 4,693,406, Cl. 227-63.000.

Centofanti, Ermand: *See*—
Hansel, Allen; Centofanti, Ermand; and Natarajan, Thiagarajan, 4,694,194, Cl. 307-66.000.

Centre National de la Recherche Scientifique: *See*—
Le Beyec, Yvon; and Negra, Serge D., 4,694,168, Cl. 250-287.000.

Cesna, Joseph V., to Speedfam Corporation. Measuring bar for free abrasive machines. 4,693,012, Cl. 33-533.000.

Cezanne, Gunter: *See*—
Roemer, Erich; Schopf, Eckhart; and Cezanne, Gunter, 4,693,617, Cl. 384-282.000.

Cgee Alsthom: *See*—
Heng, Jean-Paul; Marmonier, Andre ; Ruiz, Ariel; and Guernet, Henri, 4,693,542, Cl. 439-626.000.

Chabbal, Jean J., to Thomson-CSF. Multilinear charge transfer array and analysis process. 4,694,316, Cl. 357-24.000.

Chabner, Bruce A.: *See*—
Allegra, Carmen; Drake, James C.; Chabner, Bruce A.; Masur, Henry; and Kovacs, Joseph A., 4,694,007, Cl. 514-260.000.

Chadwick, P. N. R.: *See*—
Schlenk, Manfred; and Chadwick, P. N. R., 4,694,193, Cl. 307-62.000.

Chakrabarti, Paritosh M.; Desai, Sureshchandra G.; and Wood, Lindley S., Jr., to GAF Corporation. Phase transfer catalysts. 4,694,104, Cl. 564-285.000.

Chakrabarti, Paritosh M.: *See*—
Juda, Robert H.; Crawford, Roger A.; and Chakrabarti, Paritosh M., 4,693,894, Cl. 424-150.000.

Chambersburg Engineering Company: *See*—
Crout, Charles J.; Frame, Charles W.; and Harris, Ronald N., 4,693,101, Cl. 72-20.000.

Chan, C. S.; and Hay, Robert R., to Hewlett-Packard Company. Barrier layer and orifice plate for thermal ink jet printhead assembly. 4,694,308, Cl. 346-140.00R.

Chan, Hugo W. K.: *See*—
Cheung, Robin W.; and Chan, Hugo W. K., 4,693,925, Cl. 428-189.000.

Chan, Wan-kit: *See*—
Loev, Bernard; Chan, Wan-kit; and Jones, Howard, 4,694,023, Cl. 514-559.000.

Chang, Hong-Tsuan. Automatic container-filling apparatus. 4,693,285, Cl. 141-71.000.

Chang, Shih-Jeh; Emery, Richard T.; Hakim, Shafik J.; and Sand, Douglas S., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Controlling multi-fort hunt groups in a distributed control switching system. 4,694,487, Cl. 379-269.000.

Chao, Paul, to Cotek Company. Non-glaze coating for a cathode ray tube. 4,694,218, Cl. 313-478.000.

Chappel, Raymond M.: *See*—
Bremer, Roger E.; Anthony, Charles, Jr.; and Chappel, Raymond M., 4,693,711, Cl. 604-306.000.

Chappell, Gilmore H. Derailleur shifter. 4,693,700, Cl. 474-80.000.

Charbonneau, Arthur G.: *See*—
McNennamy, John A.; Nafziger, Steven; Charbonneau, Arthur G.; and Godfrey, Dwaine A., 4,693,113, Cl. 73-168.000.

Charbonneau and Godfrey Associates: *See*—
McNennamy, John A.; Nafziger, Steven; Charbonneau, Arthur G.; and Godfrey, Dwaine A., 4,693,113, Cl. 73-168.000.

Chatham, Dale: *See*—
Ballard, Jerry L.; Chatham, Dale; and Gaulke, Gerald E., 4,694,392, Cl. 364-200.000.

Chayka, Stanley J.: *See*—
Belmares-Sarabia, Armand; and Chayka, Stanley J., 4,694,329, Cl. 358-22.000.

Chedid, Louis: *See*—
Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Chedid, Louis; Choay, Jean; and Lederer, Edgar, 4,693,998, Cl. 514-62.000.

Cheever, Charles J.: *See*—
Gowda, Hanumaiah L.; Cheever, Charles J.; and Bloom, Frank, 4,694,213, Cl. 310-90.000.

Chemicals Inspection & Testing Institute: *See*—
Takahata, Yasuyo; and Miyagawa, Ryuji, 4,694,092, Cl. 556-400.000.

Chen, Allen G.: *See*—
Lenz, Herman N.; and Chen, Allen G., 4,693,667, Cl. 415-115.000.

Chen, Richard J., to Polaroid Corporation. Camera for producing fully mounted transparencies. 4,693,576, Cl. 354-86.000.

Chenevas-Paule, Andr' ; and Clerc, Jean-Frederic, to Commissariat A L'Energie Atomique. Active matrix display screen without intersection of the addressing columns and rowscu4,694,283,a, Cl. 340-719.000.

Cheng, Fred T., to National Semiconductor Corporation. Nonsynchronous independent side band AM stereo decodercu4,694,501, Cl. 381-15.000.

Cheng, Peter S. C. Ascending and descending balloon action toycu4,693,695, Cl. 446-220.000.

Cheo, Peter K., to United Technologies Corporation. Optically buffered waveguide modulatorcu4,693,549, Cl. 350-96.140.

Cheung, Edward H., to Innings Telecom Inc. Computerized system for routing incoming telephone calls to a plurality of agent positionscu4,694,483, Cl. 379-34.000.

Cheung, Robin W.; and Chan, Hugo W. K., to Advanced Micro Devices, Inc. Integrated circuit structure having intermediate metal silicide layercu4,693,925, Cl. 428-189.000.

Chevron Research Company: *See*—
Sie, Swan A., 4,694,162, Cl. 250-231.00R.

Chiang, John S. C., to FMC Corporation. Process for manufacturing hydrogen peroxide electrolyticallycu4,693,794, Cl. 204-84.000.

Chiaves, Carlo, to Tensiter S.p.A. Prefabricated support and covering structure, particularly for constructing tunnels, bridges and the likecu4,693,634, Cl. 405-126.000.

Chicopee: *See*—
Buyofsky, Conrad C.; and Kennette, John W., 4,693,922, Cl. 428-134.000.

Chida, Takeshi: *See*—
Maeda, Akio; Chida, Takeshi; and Seya, Hirokatsu, 4,694,067, Cl. 528-393.000.

Chien, James C. W.: *See*—
Archer, Ronald D.; Hardiman, Christopher J.; Grybos, Ryszard; and Chien, James C. W., 4,693,957, Cl. 430-269.000.

Chinn, Leland J., to G. D. Serale & Co. Substituted 1,5-diphenyl-2-pyrrolepropionic acids and derivativescu4,694,018, Cl. 514-427.000.

Chirchirillo, Michael T.; and Cannan, Terrance, to Velsicol Chemical Corporation. Bird repellent compositioncu4,693,889, Cl. 424-83.000.

Chmelir, Miroslav; Dahmen, Kurt; Hoffman, Georg; and Werner, Georg. Absorbents for blood and serous body fluidscu4,693,713, Cl. 604-368.000.

Choay, Jean: *See*—
Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Chedid, Louis; Choay, Jean; and Lederer, Edgar, 4,693,998, Cl. 514-62.000.

Choe, Eui W., to Celanese Corporation. Thermoplastic polymers containing repeating hydrazide groupscu4,694,048, Cl. 525-376.000.

Choiniere, Alcide W.; and Dunn, George T., Jr., to Automation Industries, Inc. Current-carrying flexible hosecu4,693,324, Cl. 174-47.000.

Choma, Michael A., to Ford Motor Company. EGR control systemcu4,693,226, Cl. 123-568.000.

CHR Industries, Inc.: *See*—
Agarwal, Arun K.; and Balian, Charles, 4,693,920, Cl. 428-40.000.

Christenson, Roger M.: *See*—
Piccirilli, Robert M.; Christenson, Roger M.; Falk, Frederick A.; and Makhlouf, Joseph M., 4,693,846, Cl. 260-97.000.

Christopher, Todd J., to RCA Corporation. Digital delay interpolation filter with amplitude and phase compensationcu4,694,414, Cl. 364-724.000.

Chu, Yung-Feng; and Vartuli, James C., to Mobil Oil Corporation. Process for isomerizing alkyl aromatic hydrocarbons utilizing ZSM-23 zeolite and a hydrogenation/dehydrogenation metalcu4,694,114, Cl. 585-481.000.

Chuio, Yoshiki; Kayanuma, Nobuaki; Bessho, Hironori; Masui, Takatoshi; Nagai, Toshinari; Katsuno, Toshiyasu; and Tanahashi, Toshio, to Toyota Jidosha Kabushiki Kaisha. Double air-fuel ratio sensor system having improved response characteristicscu4,693,076, Cl. 60-274.000.

Churvis, Michael A.: *See*—
McFarland, William W.; Gandy, Russell E.; and Churvis, Michael A., 4,693,413, Cl. 229-48.00R.

Ciba-Geigy Corporation: *See*—
Bauer, Sigrid, 4,693,961, Cl. 430-325.000.
Beriger Ernst, 4,694,014, Cl. 514-363.000.
Bowles, James B.; White, Marshall, Jr.; Puentener, Alois; Adam, Jean-Marie; and Loew, Peter, 4,693,727, Cl. 8-549.000.
Brunner, Hans-Georg, 4,693,745, Cl. 71-94.000.
Durr, Dieter, 4,694,105, Cl. 564-430.000.
Hubele, Adolf; Zondler, Helmut; Riebli, Peter; and Eckhardt, Wolfgang, 4,694,009, Cl. 514-269.000.

Langley, Robert; Stewart, John D.; and Walls, Arthur S., 4,694,078, Cl. 540-141.000.
Lehmann, Hans; and Zahir, Abdul-Cader, 4,694,096, Cl. 558-251.000.
Meyer, Willy; and Fory, Werner, 4,693,741, Cl. 71-92.000.
Pfeifer, Josef, 4,694,061, Cl. 528-125.000.

Citizen Watch Co. Ltd.: *See*—
Ito, Katsu, 4,694,347, Cl. 358-236.000.
Kamiya, Kiyoshi; Shiraishi, Atsushi; and Suzuki, Fuminori, 4,694,348, Cl. 358-236.000.
Murata, Mitsuhiro, 4,694,410, Cl. 364-558.000.

Claas OHG: *See*—
Freye, Theodor; and Heidjann, Franz, 4,693,259, Cl. 130-27.00R.

Clairson International: *See*—
Muth, William, 4,693,380, Cl. 211-35.000.

Clare, Kenneth; and Gibson, William, to Kelco International Limited. Hydrocolloid blend for controlled release of calcium ionscu4,693,728, Cl. 8-561.000.

Clarion Co., Ltd.: *See*—
Tazaki, Satoru; Yoshioka, Yasuhiro; and Amazawa, Kiyoshi, 4,694,500, Cl. 381-10.000.

Clark, Bill W., to Seaboard Wellhead Control, Inc. Electric fed-thru connector assemblycu4,693,534, Cl. 439-276.000.

Clark, Marion D.; and Anderson, C. Lawrence. Schottky barrier charge coupled device (CCD) manufacturecu4,692,993, Cl. 437-53.000.

Claydon, Glenn S.: *See*—
Steigerwald, Robert L.; Routh, Kevin C.; Claydon, Glenn S.; and Bicknell, William H., 4,694,384, Cl. 363-17.000.

Clerc, Jean-Frederic: *See*—
Chenevas-Paule, Andr' ; and Clerc, Jean-Frederic, 4,694,283,a, Cl. 340-719.000.

Clerc, Michel, to Cycles Peugeot. Exhaust muffler for a motor vehicle or the likecu4,693,338, Cl. 181-231.000.

Clerc, Michel M.; Mouhot, Frederic M.; and Barnabe, Jean-Pierre, to Cycles Peugeot. Telescopic sub-assembly for a steering columncu4,693,136, Cl. 74-492.000.

Cleveland, Dixon: *See*—
Nagel, Gregory L.; Sidlosky, David M.; Murty, Balarama V.; Lee, Anthony; and Cleveland, Dixon, 4,694,135, Cl. 219-110.000.

Cleveland, Richard S.: *See*—
Connor, Mark J.; Reinemuth, George H.; and Cleveland, Richard S., 4,693,109, Cl. 72-456.000.

Clifford, Peter P.: *See*—
Lane, Bruce B.; Westerkamp, Douglas F.; and Clifford, Peter P., 4,694,190, Cl. 290-52.000.

Clover, William M., Jr., to Orthomedics, Inc. Orthosiscu4,693,239, Cl. 128-80.00F.

Clyne, Carl W.: *See*—
Richmond, Donald W.; Clyne, Carl W.; and Holben, Tod M., 4,693,902, Cl. 426-407.000.

Codman & Shurtleff, Inc.: *See*—
Mickiewicz, Stanley P.; and Coombes, Alan, 4,693,254, Cl. 128-421.000.

Coemar S.p.A.: *See*—
Dedoro, Bruno, 4,694,381, Cl. 362-307.000.

Cohen, Donald K.; and Yardy, Raymond, to International Business Machines Corp. Optical signal recorders employing two lasers and methods thereforcu4,694,447, Cl. 369-110.000.

Colberg, Horst; and Hahn, Erwin, to BASF Aktiengesellschaft. Bisazo compounds containing anthranilic acid and thiazole moietiescu4,694,075, Cl. 534-604.000.

Cole, Berton A.: *See*—
Kowalski, Joseph C.; Mottaz, Donald A.; and Cole, Berton A., 4,693,926, Cl. 428-204.000.

Colgate-Palmolive Company: *See*—
Tavss, Edward A.; Santalucia, John; and Carroll, David L., 4,693,395, Cl. 222-107.000.
Tavss, Edward A.; Temin, Samuel; Santalucia, John; and Carroll, Davis L., 4,693,396, Cl. 222-107.000.

Colleran, Stephen A.; and Lenz, William R., to Molex Incorporated. Modular staggered multi-row electrical connectorcu4,693,532, Cl. 439-594.000.

Colleran, Stephen A.; and Doles, Connie, to Molex Incorporated. Insulation displacement terminalcu4,693,536, Cl. 439-404.000.

Collins, Henry R., Jr. Self-cleaning filter systemcu4,693,815, Cl. 210-107.000.

Collins, Michael S.; Tsay, Grace C.; and Seng, Richard L., to Miles Laboratories, Inc. Vaccine for *Pseudomonas aeruginosa*cu4,693,891, Cl. 424-92.000.

Collomb, Jean: *See*—
Rhenter, Jean L.; and Collomb, Jean, 4,693,724, Cl. 623-23.000.

Colvin, Howard A.: *See*—
Smith, Robert A.; Parker, Dane K.; Colvin, Howard A.; Weinstein, Arthur H.; Patterson, Dennis B.; and Cottman, Kirkwood S., 4,694,057, Cl. 526-206.000.

Combet, Roger: *See*—
Billard, Georges; Blanchard, Francoise; Klemenz, Willy; Combet, Roger; and Richard, Daniel, 4,693,429, Cl. 242-18.00G.

Comeau, Perry. Sports packcu4,693,402, Cl. 224-215.000.

Cominco, Ltd.: *See*—
Warren, Ian H.; and Mok, Felix, 4,693,790, Cl. 204-1.00T.

Commarmot, Roger; Didenot, Dominique; and Gardais, Jean-Francois, to Societe Prolabo (Societe Anonyme). Mineralization apparatus for the individual, automatic, treatment of samples of products placed in recipientscu4,693,867, Cl. 422-64.000.

Commissariat a l'Energie Atomique: *See*—
Aubert, Gilles, 4,693,279, Cl. 138-108.000.
Chenevas-Paule, Andr' ; and Clerc, Jean-Frederic, 4,694,283,a, Cl. 340-719.000.
Gabard, Jean-Jacques, 4,693,723, Cl. 623-19.000.
Latge, Christian, 4,693,088, Cl. 62-55.500.

Commonwealth of Australia, The: *See*—
Robinson, David E., 4,693,120, Cl. 73-618.000.

Community of Jesus, Inc.: *See*—
Taylor, Cynthia L.; and Nash, Judith E. M., 4,693,289, Cl. 150-52.00R.

Computer X, Inc.: *See*—
Weisshaar, Bernhard P.; Kolnick, Frank C.; Kun, Andrew I.; and Mansfield, Bruce M., 4,694,396, Cl. 364-300.000.

Comstock, Todd M., to Grand Royalties, Ltd. Candle apparatuscu4,693,681, Cl. 431-324.000.

Conair Corporation: *See*—
Yau, Yuk M., 4,693,854, Cl. 261-84.000.

Concept Engineering and Design Corporation: *See*—
Hahn, Jerome S., 4,693,439, Cl. 248-37.600.

Concurrent Computer Corporation: *See*—
Hansel, Allen; Centofanti, Ermand; and Natarajan, Thiagarajan, 4,694,194, Cl. 307-66.000.

Conforto, Peter M.: *See*—
Olsen, Peter C., Jr.; Conforto, Peter M.; Wolf, David L.; and Hudson, Donald R., 4,693,055, Cl. 53-443.000.

Connor, Mark J.; Reinemuth, George H.; and Cleveland, Richard S., to Wickes Manufacturing Company. Self-aligning tool assembly for die shaping workpiecescu4,693,109, Cl. 72-456.000.

Conoco Inc.: *See*—
Beck, Jeffrey L.; and Campbell, David W., 4,693,826, Cl. 210-512.100.
Royer, D. Jack, 4,693,321, Cl. 137-13.000.

Constable, Douglas W., to Eastman Kodak Company. Black and white level adjustment and normalization circuit for a color video printercu4,694,355, Cl. 358-332.000.

Constable, Douglas W., to Eastman Kodak Company. Modification of color component video signals to compensate for decreasing white sensitivity of photographic elementcu4,694,356, Cl. 358-332.000.

Continental Can Company, Inc.: *See*—
Hekal, Ihab M., 4,693,390, Cl. 220-359.000.
Roth, Donald J., 4,693,391, Cl. 220-359.000.

Continental Laser Corporation: *See*—
Jones, Ronald E.; and Peterson, Royal D., 4,694,462, Cl. 372-61.000.

Contreras, Joseph P., Sr. Hinge, and boss assembly for closure membercu4,693,392, Cl. 220-343.000.

Control Data Corporation: *See*—
Harte, Kenneth J., 4,694,178, Cl. 250-396.00R.

Conway, Gerald A. Pad holder and displaycu4,693,441, Cl. 248-225.100.

Conway, Tim D., to Sunkist Growers Inc. Method and apparatus for optically measuring the volume of generally spherical fruitcu4,693,607, Cl. 356-380.000.

Cook, Incorporated: *See*—
Coons, Harold G., 4,693,250, Cl. 128-345.000.

Cook, Jerry A.: *See*—
Bilimoria, Bomi M.; Lewis, Herbert I.; Cook, Jerry A.; Turner, Ralph E.; and Garner, Robert H., 4,693,427, Cl. 241-23.000.

Cook Paint and Varnish Company: *See*—
Land, John M., 4,694,029, Cl. 522-8.000.

Coombes, Alan: *See*—
Mickiewicz, Stanley P.; and Coombes, Alan, 4,693,254, Cl. 128-421.000.

Coons, Harold G., to Cook, Incorporated. Method for dilating puncture site in the renal pelviscu4,693,250, Cl. 128-345.000.

Cooper Industries, Inc.: *See*—
Visser, Leonard J., 4,694,122, Cl. 174-106.00R.

Cooper, Randy G. Steering knuckle and spindle assemblycu4,693,487, Cl. 280-96.100.

Copal Company Limited: *See*—
Nakamori, Masao; and Ichinose, Harunobu, 4,694,363, Cl. 360-99.000.

Cordes, Werner, to Aristo Graphic SySteme GmbH & Co. KG. Sensor magnifying glass apparatuscu4,693,554, Cl. 350-244.000.

Corella, Arthur P. Package, instrumentation, system and method for packaging flaccid items, filaments and the likecu4,693,365, Cl. 206-63.300.

Cork, William H.: *See*—
Wirstrom, Peter; and Cork, William H., 4,694,492, Cl. 380-23.000.

Cormack, Robert J., to Ferranti, plc. Servo positioning systemcu4,694,229, Cl. 318-561.000.

Cormier, Ginette: *See*—
Leveille, Serge; Cormier, Jacqueline; Cormier, Ginette; and Brassard, Pierre, 4,694,284, Cl. 340-574.000.

Cormier, Jacqueline: *See*—
Leveille, Serge; Cormier, Jacqueline; Cormier, Ginette; and Brassard, Pierre, 4,694,284, Cl. 340-574.000.

Cornell Research Foundation, Inc.: *See*—
Saxena, Brij B.; and Rathnam, Premila, 4,693,969, Cl. 435-7.000.

Corning Glass Works: *See*—
Danielson, Paul S., 4,693,987, Cl. 501-70.000.

Corporate Communications Consultants, Inc.: *See*—
Belmares-Sarabia, Armand; and Chayka, Stanley J., 4,694,329, Cl. 358-22.000.

Costantini, Giorgio, to Honeywell Information Systems Italia. Microprocessor system having a multiplexed address/data bus which communicates with a plurality of memory and input/output devices including TTL output gatescu4,694,394, Cl. 364-200.000.

Cosworth Research and Development Limited: *See*—
Campbell, John, 4,693,292, Cl. 164-34.000.

Cote, Richard J.: *See*—
Houghton, Alan N.; Brooks, Hannah; Cote, Richard J.; Oettgen, Herbert F.; and Old, Lloyd J., 4,693,966, Cl. 435-7.000.

Cotek Company: *See*—
Chao, Paul, 4,694,218, Cl. 313-478.000.

Cottman, Kirkwood S.: *See*—
Smith, Robert A.; Parker, Dane K.; Colvin, Howard A.; Weinstein, Arthur H.; Patterson, Dennis B.; and Cottman, Kirkwood S., 4,694,057, Cl. 526-206.000.

Coulter Electronics, Inc.: *See*—
Mitchell, Gary A.; Jaffe, Gerald E.; and Solorzano, Marilyn M., 4,694,070, Cl. 530-329.000.

Cowan, Colin F. N.: *See*—
Adams, Peter F.; and Cowan, Colin F. N., 4,694,451, Cl. 370-32.100.

Cox, Karmen D., to Emerson Electric Co. Digital capacitance incremental encodercu4,694,275, Cl. 340-347.00P.

Crane, Stephen M.: *See*—
Brenholt, David L.; Crane, Stephen M.; Fischer, Paul M.; and Mattson, Kenneth V., 4,693,663, Cl. 414-735.000.

Crast, Leonard B., Jr., to Bristol-Myers Company. 3-propenyl cephalosporin solvatescu4,694,079, Cl. 540-215.000.

Crawford, Duffer B.: *See*—
Tarakad, Ramanathan R.; and Crawford, Duffer B., 4,693,731, Cl. 55-72.000.

Crawford, Roger A.: *See*—
Juda, Robert H.; Crawford, Roger A.; and Chakrabarti, Paritosh M., 4,693,894, Cl. 424-150.000.

Creagan, Richard P.: *See*—
Wiesehahn, Gary P.; Creagan, Richard P.; Stevens, David R.; and Giles, Richard, 4,693,981, Cl. 435-238.000.

Creedon, Richard L., to GA Technologies Inc. Variable modulus filament wound pressure tubecu4,693,281, Cl. 138-174.000.

Crinos Industria Farmacobiologica S.p.A.: *See*—
Prino, Giuseppe; Mantovani, Marisa; and Niada, Riccardo, 4,693,995, Cl. 514-44.000.

Croce, Carlo M.: *See*—
Kozbor, Danuta; and Croce, Carlo M., 4,693,975, Cl. 435-172.200.

Crompton & Knowles Corporation: *See*—
Den Boer, Patrick; and Heinze, Richard F., 4,693,751, Cl. 106-209.000.

Cross, Dan A., to Boeing Company, The. Connector block for use with a robotic wire harness assembly systemcu4,692,974, Cl. 29-33.00M.

Cross, Michael A.; and Nichols, Edward W., to Westinghouse Electric Corp. Optical beam analyzercu4,693,600, Cl. 356-121.000.

Cross, Richard A., to Rockwell International Corporation. Frequency modulation monitor circuit and methodcu4,694,263, Cl. 332-20.000.

Croteau, Francis R., to Baird Corporation. Digital image frame processorcu4,694,398, Cl. 364-414.000.

Crout, Charles J.; Frame, Charles W.; and Harris, Ronald N., to Chambersburg Engineering Company. Adaptive, self-regulating forging hammer control methodcu4,693,101, Cl. 72-20.000.

Crowell Corporation, The: *See*—
Raszewski. Lewis R., 4,693,056, Cl. 53-450.000.

Crowell, Jonathan C.: *See*—
Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; and Crowell, Jonathan C., 4,693,778, Cl. 156-361.000.

Crown International, Inc.: *See*—
Bartlett, Bruce, 4,694,499, Cl. 381-155.000.

Cuddihy, James W.: *See*—
Harvey, John C.; and Cuddihy, James W., 4,694,490, Cl. 380-20.000.

Culkin, Joseph B., to Dorr-Oliver Incorporated. Electrically augmented vacuum filtration apparatus for producing a dialyzed cake productcu4,693,802, Cl. 204-182.400.

Cullum, Dennis F., to Eastman Kodak Company. Apparatus useful in channel equalization adjustmentcu4,694,468, Cl. 375-10.000.

Cummins Allison Corporation: *See*—
Raterman, Donald E.; and Amburn, James M., 4,693,428, Cl. 241-167.000.

Cunningham, Arthur L. Beam form and slab form adjustment structurecu4,693,449, Cl. 249-210.000.

Cunningham, James L.; and Campbell, Bonnie J., to Wolverine Tube, Inc. Method for making heat exchange tubescu4,692,978, Cl. 29-157.30A.

Curtis, Donald D., to United States of America, Navy. Control of processibility by particle size in high energy solid propellantscu4,693,764, Cl. 149-19.400.

Curtiss, Walter W.; and Lynch, John E., to Goodyear & Rubber Company, The. Bias ply snow tire compatible with radial ply tirescu4,693,290, Cl. 152-450.000.

Cuthbert, Victor W.; and Snider, Joel M., to Whirlpool Corporation. Method of constructing a cabinet for an automatic washercu4,692,987, Cl. 29-455.00R.

Cycles Peugeot: *See*—
Clerc, Michel, 4,693,338, Cl. 181-231.000.
Clerc, Michel M.; Mouhot, Frederic M.; and Barnabe, Jean-Pierre, 4,693,136, Cl. 74-492.000.

Cykman, Josef. Locking arrangement for the gearshift stick of vehiclescu4,693,099, Cl. 70-247.000.

D. L. West Manufacturing, Inc.: *See*—
Drain, James M., 4,693,443, Cl. 248-447.100.

Dab-O-Matic Corp.: *See*—
Schwartzman, Gilbert, 4,693,623, Cl. 401-206.000.

Dabelstein, Klaus; and Skrobol, Christian, to Erwin Sick GmbH Optik-Elektronik. Light scanning device for determining the condition of a surface with a light concentratorcu4,693,601, Cl. 356-237.000.

Dadley, David A.; and Haskins, Peter J., to Royal Ordnance plc. Linear cutting chargecu4,693,181, Cl. 102-307.000.

Dahlback, Carl M. O.: *See*—
Axelsson, Bengt I.; Brattsand, Ralph L.; Dahlback, Carl M. O.; Kallstrom, Leif A.; and Trofast, Jan W., 4,693,999, Cl. 514-174.000.

Dahmen, Kurt: *See*—
Chmelir, Miroslav; Dahmen, Kurt; Hoffman, Georg; and Werner, Georg, 4,693,713, Cl. 604-368.000.

Daigle, Clement; and Gonthier, Emile, to Les Industries Fortier Ltee. Molded elastomeric circular gasketcu4,693,482, Cl. 277-207.00A.

Daigne, Bernard: *See*—
Slodzian, Georges; Daigne, Bernard; and Girard, Francois, 4,694,170, Cl. 250-309.000.

Daiichi Koshuha Kogyo Kabushiki Kaisha: *See*—
Ino, Toshio; Maenosono, Tsukasa; Yoshida, Kazuo; Terasaki, Masanori; Kuriwaki, Tetsusho; Koga, Tadao; and Hirado, Miharu, 4,694,131, Cl. 219-10.410.

Daikuzono, Norio, to Surgical Laser Technologies, Inc. Medical and surgical laser probe Icu4,693,244, Cl. 128-303.100.

Daimler-Benz Aktiengesellschaft: *See*—
Arold, Klaus; Koukal, Heinz; Grimm, Hermann, deceased; and Trube, Hans, 4,693,417, Cl. 237-12.30B.
Baehrle, Friedrich; Wulf, Helmut; and Kreeb, Helmut, 4,693,301, Cl. 165-45.000.
Sumser, Siegfried, 4,693,085, Cl. 60-611.000.

Dainihon Jochugiku Co., Ltd.: *See*—
Katsuda, Yoshio; Yoshinaga, Sadao; and Mashine, Hiroyoshi, 4,693,868, Cl. 422-124.000.

Dainippon Pharmaceutical Co., Ltd.: *See*—
Kitagawa, Tsunehiro, 4,693,968, Cl. 435-7.000.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Ogami, Nobutoshi; and Kitagawa, Masaru, 4,693,211, Cl. 118-725.000.
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Daiwa Seiko Inc.: *See*—
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Dall'Osso, Gastone, to G.D. Societa per Azioni. Device for feeding cigarettes to the wrapping line of a packeting machinecu4,693,374, Cl. 209-535.000.

Dall'Osso, Gastone: *See*—
Mattei, Riccardo; and Dall'Osso, Gastone, 4,693,359, Cl. 198-474.100.

Danielson, Paul S., to Corning Glass Works. Molybdenum sealing glassescu4,693,987, Cl. 501-70.000.

Darling, Dale H., to United States of America, Energy. Foam shell cryogenic ICF targetcu4,693,938, Cl. 428-403.000.

Datron Systems, Inc.: *See*—
Bruinsma, Robert F., 4,693,629, Cl. 403-170.000.

Datwyler, Max, to MDC Max Datwyler Bleienbach AG. System for electrolytical treatment of printing cylinderscu4,693,792, Cl. 204-25.000.

Daubendiek, Richard L.; House, Gary L.; and Gersey, Timothy R., to Eastman Kodak Company. Multicolor photographic element with a tabular grain emulsion layer overlying a minus blue recording emulsion layercu4,693,964, Cl. 430-505.000.

Davies, Alan F., to Davies Office Equipment, Ltd. Methods for forming visible file pocketscu4,693,773, Cl. 156-200.000.

Davies, Graham A.; and Mavituna, Ferda, to National Research Development Corporation. Reactor for cultivating biological material such as immobilized cellscu4,693,983, Cl. 435-284.000.

Davies Office Equipment, Ltd.: *See*—
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Davis, Jeffrey L.; Evans, Daniel S.; and Hall, Lawrence P. Non-key locking cable lockcu4,693,098, Cl. 70-233.000.

Day, Gene F., to Precision Image Corporation. Self-seating toning shoe for electrostatic drum printerscu4,693,206, Cl. 118-631.000.

Day International Corporation: *See*—
Dolan, John J.; and Dye, Charles, 4,692,967, Cl. 19-244.000.

deBin, Rene F., to FMC Corporation. Twin wicketing bag machinecu4,693,701, Cl. 493-204.000.

DeBruyn, William, to Amerock Corporation. Concealed self-closing hingecu4,692,964, Cl. 16-367.000.

de Carli, Elsa, Silvana Bianchi and Giovanni Bianchi, Legal Representatives: *See*—
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DeCarlo, Frank S.; and Rosen, Frank L., to Allied Corporation. Gyrocompass navigation system for land vehiclescu4,693,114, Cl. 73-178.00R.

Dedoro, Bruno, to Coemar S.p.A. Light projector for movable optical effectscu4,694,381, Cl. 362-307.000.

Deeg, Helmut; and Imhof, Christian, to Sulzer Brothers Limited. Air outlet for room conditioning systemscu4,693,176, Cl. 98-40.120.

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Gregerson, Stanley M., 4,693,699, Cl. 464-133.000.

Degen, Peter J.; Martin, Jerold; Schriefer, Judy; and Shirley, Brenda, to Pall Corporation. Methods of concentrating ligands and active membranes used thereforcu4,693,985, Cl. 436-531.000.

DeHart, Arnold O.: *See*—
Mair, Alexander C.; Allgaier, Leonhard; and DeHart, Arnold O., 4,693,642, Cl. 408-59.000.
DeJaeger, Roger; Pagniez, Guy; and Potin, Philippe, to Societe Nationale Elf Aquitaine. Process for the preparation of linear polychlorophosphazenecu4,693,876, Cl. 423-300.000.
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Delaroche, Pierre; and Depondt, Paul. Double-glazed frame having an internal tubular blindcu4,694,144, Cl. 219-522.000.
DeLassus, Phillip; and Raich, William J., to Dow Chemical Company, The. Method for the preparation of a vinylidene chloride interpolymer filmcu4,694,068, Cl. 528-502.000.
Del Corso, Gregory J.; Carnes, Robert E.; and Esposito, David, to Carpenter Technology Corporation. Process and apparatus to simultaneously consolidate and reduce metal powderscu4,693,863, Cl. 419-13.000.
Deligny, Jean, to Societe des Cables du Mans. Mechanical control by cable with automatic adjustmentcu4,693,137, Cl. 74-501.50R.
Delnon, Hanspeter. Apparatus for orthoradial panoramic tomographycu4,694,478, Cl. 378-39.000.
Demarne, Henri: *See*—
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DeMars, Robert A. Bracket mounted towel drying cabinetcu4,694,146, Cl. 219-524.000.
DeMartino, Ronald N.; Yoon, Hyun-Nam; Stamatoff, James B.; and Buckley, Alan, to Celanese Corporation. Polyoxyalkylene polymers exhibiting nonlinear optical responsecu4,694,066, Cl. 528-373.000.
Demeyer, Pierre, to Merlin Gerin. Circuit breaker with digital solid-state trip unit with optional functionscu4,694,373, Cl. 361-96.000.
DeMinco, Chris M.; Field, Martin J.; and Judd, Richard K., to General Motors Corporation. Fuel vapor storage canister having tortuous vent passagecu4,693,393, Cl. 220-374.000.
Demmer, Walter H., to RCA Corporation. Digital phase locked loop stabilization circuitry including a secondary digital phase locked loop which may be locked at an indeterminate frequencycu4,694,326, Cl. 358-19.000.
Demmer, Walter H.; Harwood, Leopold A.; Patel, Chandrakant B.; and Balaban, Alvin R., to RCA Corporation. Digital phase locked loop stabilization circuitry using a secondary digital phase locked loopcu4,694,327, Cl. 358-19.000.
De Moura, David N.: *See*—
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Den Boer, Patrick; and Heinze, Richard F., to Crompton & Knowles Corporation. Titanium dioxide suspension for use in film coatingcu4,693,751, Cl. 106-209.000.
Denhez, Alain; Hargoaa, Francis; and Aubree, Jean, to Alcatel. Device for transmitting a clock signal accompanied by a synchronization signalcu4,694,291, Cl. 340-825.200.
Dennison, Saul: *See*—
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Depondt, Paul: *See*—
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Baker, Anna M., 4,693,504, Cl. 294-1.100.
Dervan, Andrew H.: *See*—
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Design Corp.: *See*—
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Mehrgardt, Soenke, 4,694,325, Cl. 358-11.000.
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Schroeer, Bernhard, 4,694,495, Cl. 381-15.000.
Devanathan, Deva: *See*—
Scharnberg, Lorne C.; and Devanathan, Deva, 4,693,720, Cl. 623-11.000.
Devins, John C.; Dranchak, Matthew A.; and Rzad, Stefan J., to General Electric Company. Additives to prevent electrostatic charge buildup in fluids in high voltage systemscu4,694,375, Cl. 361-212.000.
Devon, Thomas J.; Phillips, Gerald W.; Puckette, Thomas A.; Stavinoha, Jerome L.; and Vanderbilt, Jeffrey J., to Eastman Kodak Company. Chelate ligands for low pressure hydroformylation catalyst and process employing samecu4,694,109, Cl. 568-454.000.
Dewey, Charles H.: *See*—
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Dewitz, Thomas S., to Shell Oil Company. Downflow fluidized catalytic cranking reactor process and apparatus with quick catalyst separation means in the bottom thereofcu4,693,808, Cl. 208-113.000.
DeYoe, Jay, to HIS, Inc. Float mattresscu4,693,691, Cl. 441-129.000.
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Meier, Helmut-Martin; Dhein, Rolf; Winkel, Jens; Klein, Gerhard; and Kloker, Werner, 4,694,041, Cl. 525-25.000.
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Dickinson, Ben Wade Oaks: *See*—
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Dickinson, Peter D.; and Luciano, Robert A. Amusement machinecu4,693,477, Cl. 273-143.00R.
Dickinson, Robert W.; Mackey, Charles S.; and Odgers, Irving L., to Dickinson, Ben Wade Oaks; and Dickinson, Robert W. Mechanically actuated whipstock assemblycu4,693,327, Cl. 175-61.000.
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Diegel, Dieter; Plohn, Gerhard; and Schuh, Manfred, deceased (by Schuh, Gisela, Sabine Schuh, Michael Schuh, heirs), to Siemens Aktiengesellschaft. Apparatus for controlling a turbo generatorcu4,694,188, Cl. 290-40.00B.
Diehl GmbH & Co.: *See*—
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Diekemper, Erwin; and Kastrup, Dieter, to MIDS Magnetische Informations-und Daten-Systeme GmbH. Access cardcu4,694,148, Cl. 235-468.000.
Diesel Kiki Co. Ltd.: *See*—
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Dieterich Standard Corporation: *See*—
Parkhurst, Larry E.; and Meadows, Michael R., 4,694,159, Cl. 250-227.000.
Dietsche, Wolfram: *See*—
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DiFrank, Frank J., to Owens-Illinois, Inc. Quick change fountaincu4,693,210, Cl. 118-259.000.
Dill, Hans G.: *See*—
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DiMeo, Frank N., to Litton Systems, Inc. Robot grippercu4,693,505, Cl. 294-119.100.
Dines, David R.; and Webb, Vertis C., to American Telephone and Telegraph, Company AT&T Technologies, Inc. Apparatus for bonding connector terminals to circuit boardscu4,693,408, Cl. 228-47.000.
Dingerdissen, John J.; Mehta, Rajanikant; Nisbet, Louis J.; Shearer, Marcia C.; and Wasserman, Gail F., to SmithKline Beckman Corporation. *Kibdelosporangium aridum* SK&F-AAD-609cu4,694,069, Cl. 530-317.000.
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Divers, George A., III: *See*—
Bannick, Mark A.; Divers, George A., III; and Jansons, Viktors, 4,693,851, Cl. 260-544.00D.
Dixon, Dale D.; and Burgoyne, William F., to Air Products and Chemicals, Inc. Tertiary butyl derivatives of toluenediamine and mixtures as antioxidant for organic materialscu4,693,837, Cl. 252-50.000.
DMI Fabrications Limited: *See*—
Sills, James R., 4,693,442, Cl. 248-406.200.
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Callahan, David T.; and Dobyns, David W., 4,693,026, Cl. 40-576.000.
Dr. h.c.F. Porsche Aktiengesellschaft: *See*—
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Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Ampferer, Herbert; and Groger, Klaus, 4,693,216, Cl. 123-195.00R.
Dr. Ing. P. Osypka GmbH Medizinelektronik: *See*—
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Dodds, Diego E. F., to Oboler, Leonard. Heat exchanging apparatus for cooling and condensing by evaporationcu4,693,302, Cl. 165-46.000.
Dofasco Inc.: *See*—
Easton, Trevor A.; and Gaiser, John A., 4,693,185, Cl. 105-199.200.
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Doi, Shunichi: *See*—
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Dolan, Frank, Sr.: *See*—
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Dolan, John J.; and Dye, Charles, to Day International Corporation. Textile fiber drafting apron and methodcu4,692,967, Cl. 19-244.000.

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Dollison, William W., to Otis Engineering Corporation. Position responsive valve control for hydraulic cylindercu4,693,171, Cl. 91-216.00B.

Doman, Herbert M., to Everest & Jennings, Inc. Current sharing circuitcu4,694,227, Cl. 318-80.000.

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Domenik, Stephen L.; Folmsbee, Alan C.; Nguyen, Tai; and Shirgley, David A., to Intel Corporation. Random number generator for use in an authenticated read-only memorycu4,694,412, Cl. 364-717.000.

Donald W. Lloyd Realty, Inc.: *See*—
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Donaldson Company, Inc.: *See*—
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Donsco Inc.: *See*—
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Dorsey, Michael L.: *See*—
Hughes, Larry R.; Dorsey, Michael L.; and Wensley, David, 4,693,386, Cl. 220-1.500.

Dougher, Christine A.; and Rath, Mary L. Slatted sofa-bed constructioncu4,692,952, Cl. 5-37.00R.

Douglas Battery Manufacturing Co.: *See*—
Kellett, James H.; Gaddis, Raymond W.; Fritts, Robert W.; and Schoenecker, David L., 4,693,949, Cl. 429-178.000.

Douglas, George H.: *See*—
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Douty, George H.: *See*—
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Park, Chung P., 4,694,027, Cl. 521-94.000.
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Drain, James M., to D. L. West Manufacturing, Inc. Apparatus for removeably retaining sheet materialcu4,693,443, Cl. 248-447.100.

Drake, James C.: *See*—
Allegra, Carmen; Drake, James C.; Chabner, Bruce A.; Masur, Henry; and Kovacs, Joseph A., 4,694,007, Cl. 514-260.000.

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Droske, Donald J.: *See*—
Moy, Howard; Thomas, James R.; and Droske, Donald J., 4,693,509, Cl. 296-201.000.

Drott, Peter, to Alfred Teves GmbH. Disc brake for automotive vehiclescu4,693,341, Cl. 188-72.700.

DSM Resins B.V.: *See*—
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DSM Rim Nylon V.O.F.: *See*—
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Duchesne, Paul. Porous flexible metal fiber material for surgical implantationcu4,693,721, Cl. 623-16.000.

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Dugger, Michael D., to Petro Fill, Inc. Method for underground storage tank abandonmentcu4,693,284, Cl. 141-1.000.

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Du Pont de Nemours, E. I., and Company: *See*—
Carson, David M.; and Weyant, Oakley L., Jr., 4,693,702, Cl. 494-61.000.
Gale, David M., 4,693,749, Cl. 106-99.000.
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Lahm, George P., 4,694,013, Cl. 514-345.000.
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Durabla Manufacturing Co.: *See*—
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Durant, Graham J.: *See*—
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Durr, Dieter, to Ciba-Geigy Corporation. Herbicidal alkoxyamino- and polyalkoxyaminodiphenyl etherscu4,694,105, Cl. 564-430.000.

Durtschi, William G.: *See*—
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Dye, Charles: *See*—
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Dye, John F., to Kendall Company, The. Tamper discouraging devicecu4,693,707, Cl. 604-111.000.

E&A Heyworth Enterprises, Inc.: *See*—
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E.C.C. America Inc.: *See*—
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E.I. Du Pont de Nemours and Company: *See*—
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E.R.G. Management Services Pty., Ltd.: *See*—
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E. R. Squibb & Sons, Inc.: *See*—
Floyd, David; and Atwal, Karnail, 4,694,002, Cl. 514-211.000.
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Klees, Kevin J., 4,694,342, Cl. 358-167.000.
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Edwards, A. Glen; Wesson, David S.; and Brieger, Emmet F., to Halliburton Company. Method and apparatus for absorbing shockcu4,693,317, Cl. 166-378.000.
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Eisenbeis, Martin; Hemmer, Walter; and Krummenauer, Hans, to Hans Krummenauer GmbH & Co. KG. Cutter for gouging ore or rock from mine facescu4,693,517, Cl. 299-87.000.
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Sane, Ajit Y., 4,693,989, Cl. 501-96.000.
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Emery, Phillip L.: *See*—
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Erath, Louis W., to Gas Alarm Service, Inc. Infrared gas detector-cu4,694,174, Cl. 250-345.000.
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Erzinger, Bradley F. Method and composition for removing asbestos-containing materialscu4,693,755, Cl. 134-4.000.
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Bock, Jan; Siano, Donald B.; and Turner, S. Richard, 4,694,046, Cl. 525-329.400.
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Fairchok, William J.; Friedrich, Ralph E.; Thill, Bruce P.; and McKinley, Mark J., to Dow Chemical Company, The. Process for absorbing polar materials using transamidated poly-2-oxazoline composition-scu4,694,050, Cl. 525-411.000.
Falb, Wolfgang; Ryschka, Martin; and Wallroth, Carl-Friedrich, to Dragerwerk Aktiengesellschaft. Anesthetic vaporizercu4,693,853, Cl. 261-39.100.
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Fujimoto, Masakazu; and Kogaito, Kikuo, to Ebara Corporation. System for controlling fluid flow in a tube of a heat exchangercu4,693,305, Cl. 165-95.000.

Fujimoto, Masashi; and Kato, Yoshihisa, to Toshiba Ceramics, Ltd. Tool for firing ceramicscu4,693,918, Cl. 428-35.000.

Fujino, Akihiko: *See*—
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Fujioka, Tadashi: *See*—
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Fujisawa Pharmaceutical Co., Ltd.: *See*—
Nakaguti, Osamu; Shimazaki, Norihiko; Kawai, Yoshio; Hashimoto, Masashi; and Nakatuka, Michie, 4,694,004, Cl. 514-228.000.

Fujishima, Kazuyasu: *See*—
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Fujita, Tsutomu: *See*—
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Fujita, Yoshiji: *See*—
Shiono, Manzo; Fujita, Yoshiji; and Nishida, Takashi, 4,694,090, Cl. 549-407.000.

Fujitsu Limited: *See*—
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Kaku, Takashi; and Arai, Yasuhiro, 4,694,469, Cl. 375-13.000.
Miyamura, Tamio; and Ohkawa, Takashi, 4,694,431, Cl. 365-189.000.

Fukai, Isamu; and Azami, Katsumasa, to Sanden Corporation. Cylinder head for refrigerant compressorcu4,693,674, Cl. 417-269.000.

Fuke, Takamichi, to Alps Electric Co., Ltd. Device for shifting carriagecu4,694,366, Cl. 360-106.000.

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Fulmer, Keith H., to Allied Corporation. Pressure-balanced seals for vented accumulatorscu4,693,276, Cl. 138-31.000.

Furse, John H.; Desai, Praful C.; and Dewey, Charles H., to Smith International, Inc. Expandable well drilling toolcu4,693,328, Cl. 175-273.000.

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Futakami, Katsuyuki: *See*—
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Futaki, Kiyoshi: *See*—
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Futami, Toru: *See*—
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Futami, Toshio: *See*—
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Fuzimura, Yasuyuki, to Kankyo Company Limited. Air cleanercu4,693,733, Cl. 55-129.000.

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G. D. Serale & Co.: *See*—
Chinn, Leland J., 4,694,018, Cl. 514-427.000.

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Dall'Osso, Gastone, 4,693,374, Cl. 209-535.000.
Mattei, Riccardo; Gorrieri, Giordano; and Filippini, Gualtiero, 4,693,051, Cl. 53-148.000.
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G & F Precision, Inc.: *See*—
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GA Technologies Inc.: *See*—
Burnett, Sibley C.; Purcell, John R.; and Horner, M. Harlan, 4,694,269, Cl. 335-216.000.
Creedon, Richard L., 4,693,281, Cl. 138-174.000.

Gabard, Jean-Jacques, to Commissariat a l'Energie Atomique. Shoulder prosthesiscu4,693,723, Cl. 623-19.000.

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GAF Corporation: *See*—
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Gaiser, John A.: *See*—
Easton, Trevor A.; and Gaiser, John A., 4,693,185, Cl. 105-199.200.

Gale, David M., to Du Pont de Nemours, E. I., and Company. Cement reinforcementcu4,693,749, Cl. 106-99.000.

Gale, Stephen B.; and O'Donnell, Philip P., to Niagara Environmental Associates, Inc. Method of treating contaminant ions in an aqueous medium with electrolytically generated ferrous ions, and apparatus thereforcu4,693,798, Cl. 204-149.000.

Galen, Neal. Sorter for automotive glove compartmentscu4,693,382, Cl. 211-189.000.

Galli, Guido; Grillo, Alexander A.; and Lieberman, Barry R., to Magnesys. Combined nucleate-replicate single wall domain generate structurecu4,694,424, Cl. 365-12.000.

Gallops, Henry: *See*—
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Gamma-Metrics: *See*—
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Gandy, Russell E.: *See*—
McFarland, William W.; Gandy, Russell E.; and Churvis, Michael A., 4,693,413, Cl. 229-48.00R.

Ganor, Zeev: *See*—
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Garavuso, Gerald M., to Xerox Corporation. Platen transport and vacuum plenum for book copyingcu4,693,594, Cl. 355-25.000.

Garcia, Jaime A. Paint rollercu4,692,975, Cl. 29-120.000.

Gardais, Jean-Francois: *See*—
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Bjornson, Geir; Klendworth, Douglas D.; Gardner, Lloyd E.; and Farha, Floyd E., Jr., 4,693,991, Cl. 502-220.000.

Garin, John, to Westinghouse Electric Corp. SCARA type manipulator apparatuscu4,693,666, Cl. 414-744.00R.

Garlick, George F. J.: *See*—
Lillington, David R.; Mardesich, Nick; Dill, Hans G.; and Garlick, George F. J., 4,694,115, Cl. 136-256.000.

Garner, Robert H.: *See*—
Bilimoria, Bomi M.; Lewis, Herbert I.; Cook, Jerry A.; Turner, Ralph E.; and Garner, Robert H., 4,693,427, Cl. 241-23.000.

Gartside, Roger H., to Pannier Corporation, The. Pneumatic hammercu4,693,322, Cl. 173-116.000.

Garzonetti, Gary A., to Zimpro Inc. Rise-rate control of pulsed-bed granular medium filterscu4,693,831, Cl. 210-744.000.

Gas Alarm Service, Inc.: *See*—
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Gauthier, George J.; and Miceli, John D., to Pfizer Inc. Dual catalyst sequential method for production of sorbitol from hydrolyzed starch solutioncu4,694,113, Cl. 568-863.000.

Gearhart, Dale A., to Gearhart Industries, Inc. Logging device having bimetallic insulating flaskcu4,694,166, Cl. 250-261.000.

Gearhart Industries, Inc.: *See*—
Gearhart, Dale A., 4,694,166, Cl. 250-261.000.

Gebr. Hennig GmbH: *See*—
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Gebr. Steimel: *See*—
Oehler, Henry; Peth, Norbert; Holpp, Hans W.; and Sass, Wolfgang, 4,693,017, Cl. 34-58.000.

Gelfand, Valery A., to Western Geophysical Company of America. Noise-attenuating streamer-cable bulkheadcu4,694,436, Cl. 367-20.000.

Geller, Paul. Disposable aseptic sheath for dental handpiecescu4,693,871, Cl. 433-116.000.

Geloen, Roland A. E. Process and apparatus for preparing a filling material, particularly for an article giving body protectioncu4,693,917, Cl. 428-6.000.
Gemcor Engineering Corp.: *See*—
Andrews, Mark J., 4,693,646, Cl. 409-136.000.
General Electric Company: *See*—
Devins, John C.; Dranchak, Matthew A.; and Rzad, Stefan J., 4,694,375, Cl. 361-212.000.
Hayes, Cecil E., 4,694,255, Cl. 324-318.000.
Lane, Bruce B.; Westerkamp, Douglas F.; and Clifford, Peter P., 4,694,190, Cl. 290-52.000.
Magoon, Inder K.; and Mayer, Robert E., 4,693,165, Cl. 89-7.000.
Steigerwald, Robert L.; Routh, Kevin C.; Claydon, Glenn S.; and Bicknell, William H., 4,694,384, Cl. 363-17.000.
Vatis, Dimitrios; and Smith, Lowell S., 4,694,254, Cl. 324-309.000.
Wheeler, James E.; Hardy, Robert M.; Dunki-Jacobs, Robert J.; and Premeriani, William J., 4,694,416, Cl. 364-736.000.
Wu, Alexander F.; and Walters, Robert B., 4,693,937, Cl. 428-389.000.
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General Instrument Corporation: *See*—
Blumenkranz, Robert M.; and Gibbons, Mark A., 4,694,258, Cl. 330-2.000.
Horne, Donald R.; and Jeffers, John M., 4,694,491, Cl. 380-20.000.
General Motors Corporation: *See*—
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Alty, Mark C., 4,693,127, Cl. 74-25.000.
Beer, Wilhelm, 4,693,217, Cl. 123-195.00A.
DeMinco, Chris M.; Field, Martin J.; and Judd, Richard K., 4,693,393, Cl. 220-374.000.
Elliott, James O.; and Savage, Jack W., 4,694,210, Cl. 310-68.00R.
Eshleman, Edgar S.; Field, Martin J.; and Penwright, James L., 4,693,223, Cl. 123-468.000.
Heath, Peter W., 4,693,513, Cl. 297-284.000.
Jozefczak, Thadius F., 4,692,960, Cl. 16-86.00A.
Kitzmann, Ronald A.; and Tchejeyan, Sarkis K., 4,694,130, Cl. 200-314.000.
Klomp, Edward D., 4,693,420, Cl. 239-87.000.
Mair, Alexander C.; Allgaier, Leonhard; and DeHart, Arnold O., 4,693,642, Cl. 408-59.000.
Moy, Howard; Thomas, James R.; and Droske, Donald J., 4,693,509, Cl. 296-201.000.
Nagel, Gregory L.; Sidlosky, David M.; Murty, Balarama V.; Lee, Anthony; and Cleveland, Dixon, 4,694,135, Cl. 219-110.000.
Renk, Rolf, 4,693,628, Cl. 403-135.000.
Scarselletta, Louis, 4,693,307, Cl. 165-152.000.
Sczomak, David P., 4,693,424, Cl. 239-453.000.
Skarvan, Charles A.; and fisher, Stephen A., 4,693,077, Cl. 60-39.282.
Stoltman, Donald D., 4,693,275, Cl. 137-625.650.
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Montagu, Jean I., 4,694,212, Cl. 310-90.000.
Genodman, Yury: *See*—
Niksa, Marilyn J.; Pohto, Gerald R.; Lakatos, Leslie K.; Wheeler, Douglas J.; Solomon, Frank; Niksa, Andrew J.; Schue, Thomas J.; Genodman, Yury; Turk, Thomas R.; and Hagel, Daniel P., 4,693,946, Cl. 429-27.000.
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George, Robert D.; and Banning, Robert D., to Sherwood Medical Company. Syringecu4,693,709, Cl. 604-212.000.
Gerger, Scott A., to Eastman Kodak Company. Electrographic process controlcu4,693,593, Cl. 355-14.0CH.
Gero, Ilona B. Vaginal contraceptive systemcu4,693,705, Cl. 604-55.000.
Gerrard, Donald L.; Preedy, John E.; and Williams, Kenneth P. J., to British Petroleum Company p.l.c., The. Diamond separation using raman scatteringcu4,693,377, Cl. 209-579.000.
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Gerstmann, Hans: *See*—
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Gesslauer, Rudolf. Circuit for the pulsed operation of one or more high-frequency ozonizerscu4,694,376, Cl. 361-235.000.
Gessner, Dieter; and Steckert, Rainer, to VEB Zementkombinat. Method and apparatus for the loss-free introduction of binding agents into mineral wool fleecescu4,693,913, Cl. 427-215.000.
Gibbons, David L., to Marathon Oil Company. Conformance correction to improve hydrocarbon recovery from a subterranean formationcu4,693,310, Cl. 166-270.000.
Gibbons, Mark A.: *See*—
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Girard, Leon E., to Iowa State University Research Foundation Inc. Method and means for securing plastic covered equipment to a support surfacecu4,692,968, Cl. 24-145.000.
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Gloor, Urs; Hirth, Michael; and Kogelschatz, Ulrich, to BBC Brown, Boveri & Company Limited. Tubular ozonizer with cooled inner electrodecu4,693,870, Cl. 422-186.190.
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Gormus, Bobby J., to Research Corporation. Monitoring therapy results in body samples of receptor cellscu4,693,967, Cl. 435-7.000.
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Grzanna, Ortwin; Koesfeld, Manfred; Weber, Rolf-Udo; Steuer, Aloysius; Romswinkel, Horst; Fremgen, Dieter; and Kastrop, Dieter, to Walter Rose GmbH & Co. KG. Cable sleeve with a device cross-shaped in cross-section for support of cable ends entering the cable sleevescu4,693,767, Cl. 156-49.000.
GTE Laboratories Incorporated: *See*—
Poppert, Paul E.; and Tabasky, Marvin J., 4,693,783, Cl. 156-644.000.
GTE Products Corporation: *See*—
Mickelson, Nils P.; and MacFarlane, Jerauld C., 4,694,488, Cl. 379-327.000.
GTE Valeron Corporation: *See*—
Juengel, Richard O., 4,693,110, Cl. 73-1.00R.
Guerin, Roland: *See*—
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Guernet, Henri: *See*—
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Guetersloh, Timothy L., to Research Products Corporation. Media support module for paint spray booths and the likecu4,693,048, Cl. 52-664.000.
Guill, Dennis J.; McPherson, Larry D.; and Sizelan, John H., to Rockwell International Corporation. Waveguide dehydrator apparatuscu4,694,267, Cl. 333-248.000.
Gunson's Sortex Limited: *See*—
Wainwright, Ronald C.; and Beesley, Lawrence R., 4,693,153, Cl. 83-53.000.
Gupta, Balaram B. G., to Celanese Corporation. Alkoxyalkylation of phenolcu4,694,111, Cl. 568-662.000.
Gustavsson, Harry, to AB Wedalco Centerless. Method of continuously grinding the teeth of saw bands and saw bladescu4,693,145, Cl. 76-112.000.
Guthrie, Gerald, to 5W Enterprises, Inc. Quick adjusting nutcu4,693,656, Cl. 411-433.000.
Guttag, Karl M.; and McDonough, Kevin C., to Texas Instruments Incorporated. Compressed control decoder for microprocessor systemcu4,694,391, Cl. 364-200.000.
Haag, Gottlob: *See*—
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Haas, Erich: *See*—
Bieber, Oswald; Haas, Erich; Henglein, Rudolf; and Richter, Bernd, 4,693,277, Cl. 138-89.000.
Hackleman, David E.; and Pawlowski, Norman E., to Hewlett-Packard Company. Reactive ink-jet printingcu4,694,302, Cl. 346-1.100.
Hadland Photonics Limited: *See*—
Huston, Alexander E, 4,694,346, Cl. 358-218.000.
Hagel, Daniel P.: *See*—
Niksa, Marilyn J.; Pohto, Gerald R.; Lakatos, Leslie K.; Wheeler, Douglas J.; Solomon, Frank; Niksa, Andrew J.; Schue, Thomas J.; Genodman, Yury; Turk, Thomas R.; and Hagel, Daniel P., 4,693,946, Cl. 429-27.000.
Hagele, Karl-Heinz: *See*—
Dettling, Hubert; Haag, Gottlob; Hagele, Karl-Heinz; Leonhard, Rolf; and Polach, Wilhelm, 4,693,078, Cl. 60-295.000.
Hager, Walter, to Pfaff Industriemaschinen GmbH. Apparatus for monitoring shuttle thread supply of a sewing machinecu4,693,196, Cl. 112-273.000.
Hagino, Kiyoshi: *See*—
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Hagmann, Peter: *See*—
Becker, Erwin; Ehrfeld, Wolfgang; and Hagmann, Peter, 4,693,791, Cl. 204-11.000.
Hahn, Erwin: *See*—
Colberg, Horst; and Hahn, Erwin, 4,694,075, Cl. 534-604.000.
Hahn, Jerome S., to Concept Engineering and Design Corporation. Cap cardcu4,693,439, Cl. 248-37.600.
Hahn, Lawrence R., to Fourth Dimension, Inc., The. Automatic welder's helmetcu4,694,141, Cl. 219-147.000.
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Hakim, Shafik J.: *See*—
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Halbergerhutte GmbH: *See*—
Albrecht, Karl-Hans; Luhr, Hartmut; and Pieck, Gunter, 4,693,294, Cl. 164-312.000.
Hales, John H.: *See*—
Wesson, David S.; Wall, Stanley J.; and Hales, John H., 4,693,314, Cl. 166-317.000.
Hall, Clifton W.: *See*—
Thornton, Harold C., Jr.; and Hall, Clifton W., 4,693,671, Cl. 416-43.000.
Hall, Lawrence P.: *See*—
Davis, Jeffrey L.; Evans, Daniel S.; and Hall, Lawrence P., 4,693,098, Cl. 70-233.000.
Halliburton Company: *See*—
Caskey, Kenneth D., 4,693,309, Cl. 166-123.000.
Edwards, A. Glen; Wesson, David S.; and Brieger, Emmet F., 4,693,317, Cl. 166-378.000.
Hollenbeak, Keith H.; and Brown, Paul S., Jr., 4,693,639, Cl. 405-263.000.
Luke, Robert R.; and Barker, James M., 4,693,308, Cl. 166-55.100.
Ringgenberg, Paul D.; Newman, Daniel A.; and Beck, Harold K., 4,693,316, Cl. 166-355.000.
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Hallmark Cards, Inc.: *See*—
Sanders, Robert E.; Knipp, Jerry L.; and Flynn, Charles J., 4,693,541, Cl. 439-541.000.
Halvani, Mohammed. Sesame seeds husking methodcu4,693,903, Cl. 426-456.000.
Hamada, Kiyoshi: *See*—
Tomii, Kaoru; and Hamada, Kiyoshi, 4,694,225, Cl. 315-366.000.

Hamada, Nagaharu: *See*—
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Hamai Electric Lamp Co., Ltd.: *See*—
Hamai, Jitsuo, 4,693,692, Cl. 445-66.000.

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Hamamatsu Photonics Kabushiki Kaisha: *See*—
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Hamamoto, Tatsuo: *See*—
Akiba, Yutaka; Hirota, Kazuo; Kishiro, Nobuo; Futami, Toshio; and Hamamoto, Tatsuo, 4,694,423, Cl. 365-2.000.

Hamilton, Leslie: *See*—
Blatherwick, William J.; Hamilton, Leslie; Holewinski, Robert D.; Shen, Virginia A.; Kapec, Jeffrey; and Tanaka, Kazuna, 4,693,684, Cl. 433-90.000.

Hamon, Gilles: *See*—
Nedelec, Lucien; Hamon, Gilles; Fauveau, Patrick; and Oberlander, Claude, 4,694,011, Cl. 514-323.000.

Han, Wesley W.: *See*—
Gerson, Steven H.; and Han, Wesley W., 4,694,022, Cl. 514-554.000.

Hanagata, Takayoshi, to Canon Kabushiki Kaisha. Dot matrix printer providing multiple print pulses for one energization of a printing head stepping motorcu4,693,618, Cl. 400-120.000.

Hanamori, Ryoichi; Nakashima, Shigeo; and Yamamoto, Hiroshi, to Canon Kabushiki Kaisha. Motorcu4,693,580, Cl. 354-271.100.

Hanamoto, Yoshihiro: *See*—
Shibui, Michiro; Hanamoto, Yoshihiro; Ishigaki, Yoshio; Sahara, Hiroshi; Maeda, Satoru; and Noguchi, Yasushi, 4,694,406, Cl. 364-518.000.

Hani, Kiyoshi: *See*—
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Hank, Dietrich; and Hauer, Kerstin, to VEB Kombinat Polygraph "Werner Lamberz" Leipzig. Feed roll for material web transporting and measuring web tensioncu4,693,126, Cl. 73-862.480.

Hano, Sunao: *See*—
Akatsu, Yousuke; Yamaguchi, Hirotsugu; Fukushima, Naoto; Hano, Sunao; Sugino, Masaru; Takehara, Shin; and Matsui, Shinichi, 4,693,491, Cl. 280-688.000.

Hans Krummenauer GmbH & Co. KG: *See*—
Eisenbeis, Martin; Hemmer, Walter; and Krummenauer, Hans, 4,693,517, Cl. 299-87.000.

Hansel, Allen; Centofanti, Ermand; and Natarajan, Thiagarajan, to Concurrent Computer Corporation. Power supply with battery backupcu4,694,194, Cl. 307-66.000.

Hansen, Marcia K.: *See*—
Jenekhe, Samson A.; and Hansen, Marcia K., 4,694,062, Cl. 528-232.000.

Hanson, George E., to Norand Corporation. Isolated power supply system and methodcu4,694,237, Cl. 320-6.000.

Hanson, Lowell C. Subterranean surveying apparatuscu4,694,437, Cl. 367-27.000.

Hanyu, Susumu; Hara, Kazumasa; Sasano, Akiyoshi; and Koike, Mikio, to Janome Sewing Machine Co. Ltd. Device of guiding drawing-out of a lower thread from a horizontal bobbin carrier of a sewing machinecu4,693,193, Cl. 112-121.110.

Hanyu, Susumu, to Janome Sewing Machine Co. Ltd. Adjusting device of slack amount of lower thread in zigzag sewing machinecu4,693,198, Cl. 112-443.000.

Hara, Katsuhiko: *See*—
Nakatomi, Yasuo; Hara, Katsuhiko; Umeda, Fumio; Kono, Toshiaki; and Niimoto, Hisashi, 4,693,898, Cl. 426-19.000.

Hara, Kazumasa: *See*—
Hanyu, Susumu; Hara, Kazumasa; Sasano, Akiyoshi; and Koike, Mikio, 4,693,193, Cl. 112-121.110.

Hara, Yoshifusa: *See*—
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Harada, Munenori, to Sharp Kabushiki Kaisha. Multiwindow display circuitcu4,694,288, Cl. 340-721.000.

Harada, Norimichi, to Sanshin Kogyo Kabushiki Kaisha. Controlling gear for outboard enginecu4,693,689, Cl. 440-51.000.

Harada, Takamasa; and Taguchi, Masaaki, to Seiko Instruments & Electronics Ltd. Ferro-electric liquid crystal electro-optical devicecu4,693,563, Cl. 350-350.00S.

Harada, Yoshiharu; Taga, Yutaka; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, to Toyota Jidosha Kabushiki Kaisha; and Aisin-Warner Kabushiki Kaisha. Control device for an automatic transmission systemcu4,693,143, Cl. 74-866.000.

Harada, Yoshihiro: *See*—
Miyahara, Tsuneo; Harada, Yoshihiro; Futakami, Katsuyuki; Nishida, Yasukuni; and Konishi, Ryoko, 4,693,888, Cl. 424-49.000.

Haraguchi, Eiji; Nakagawa, Hiroto; Bando, Akira; Kuwahara, Takao; Nohara, Haruo; and Ono, Kenichi, to Hitachi, Ltd.; and Kansai Electric Power Co., Inc., The. Control system for variable speed hydraulic turbine generator apparatuscu4,694,189, Cl. 290-40.00C.

Hardiman, Christopher J.: *See*—
Archer, Ronald D.; Hardiman, Christopher J.; Grybos, Ryszard; and Chien, James C. W., 4,693,957, Cl. 430-269.000.

Hardy, Robert M.: *See*—
Wheeler, James E.; Hardy, Robert M.; Dunki-Jacobs, Robert J.; and Premerlani, William J., 4,694,416, Cl. 364-736.000.

Hargoaa, Francis: *See*—
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Hargreaves, Rodney B.: *See*—
Brown, David; Hargreaves, Rodney B.; McLoughlin, Bernard J.; and Mills, Stuart D., 4,694,005, Cl. 514-234.000.

Hargrove, Benjamin F.; and Kvaternik, Billy J. Horizontally mounted submersible pump assemblycu4,693,271, Cl. 137-565.000.

Haringer, Luis, to Macmoter S.p.A. Compact excavatorcu4,693,662, Cl. 414-695.000.

Harris Corporation: *See*—
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Harris, Ronald N.: *See*—
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Harrison, Bruce L.; and Wall, Richard J., to United Technologies Automotive, Inc. Hot melt, synthetic, magnetic sealantcu4,693,775, Cl. 156-272.400.

Harrold, William J.: *See*—
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Hart, Keith L.: *See*—
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Harte, Kenneth J., to Control Data Corporation. Multiple channel electron beam optical column lithography system and method of operationcu4,694,178, Cl. 250-396.00R.

Harumatsu, Masatoshi, to Alps Electric Co.,Ltd. Variable width paper feeder for perforated and unperforated papercu4,693,620, Cl. 400-611.000.

Haruta, Masahiro: *See*—
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Haruyama, Hideaki: *See*—
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Harvey, Charles P., to British Aerospace PLC. Automatic mist preventing system for vehicle transparenciescu4,693,172, Cl. 98-2.010.

Harvey, John C.; and Cuddihy, James W. Signal processing apparatus and methodscu4,694,490, Cl. 380-20.000.

Harwood, Leopold A.: *See*—
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Harwood, Michael E.: *See*—
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Harwood, Robert E.; and Hawrylo, Frank Z., to RCA Corporation. Sharp edge formation on copper heatsinkscu4,693,649, Cl. 409-293.000.

Hasebe, Hiroshi; Asakura, Masahiko; Sakaino, Michio; and Miyashita, Yukio, to Honda Giken Kogyo K.K. Idling speed control system for internal combustion enginescu4,693,220, Cl. 123-339.000.

Hasegawa, Shinji; Kando, Yasuhiko; and Nakagomi, Tamihito, to Hitachi, Ltd. Liquid crystal display devicecu4,693,562, Cl. 350-337.000.

Hasenkopf, Joel E.; and Sutherland, James F., to Westinghouse Electric Corp. Adaptive digital filter for analog input signalscu4,694,415, Cl. 364-724.000.

Hashimoto, Akira; Nishimura, Toshihiro; Nakayama, Muneo; Nakane, Hisashi; and Toda, Shozo, to Tokyo Denshi Kagaku Kabushiki Kaisha. Liquid composition for forming a coating film of organopolysiloxane and method for the preparation thereofcu4,694,040, Cl. 524-765.000.

Hashimoto, Masashi: *See*—
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Hashimoto, Takayoshi, to Takasago Thermal Engineering Co., Ltd. Clean room systemcu4,693,175, Cl. 98-31.600.

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Hasley, Lloyd A.; and Raamot, Jaan, to American Telephone and Telegraph Company and AT&T Information Systems. Clock recovery circuitcu4,694,196, Cl. 307-269.000.

Hatada, Kenzo, to Matsushita Electric Industrial Co., Ltd. Method of bonding semiconductor devices togethercu4,693,770, Cl. 156-151.000.

by Hatono, Akio; and Kobayashi, Sumio, to Sumitomo Metal Industries, Ltd. Apparatus for detecting slag outflowcu4,693,614, Cl. 374-122.000.

Hattori, Masayuki: *See*—
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Hattori, Shintaroo: *See*—
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Hattori, Tadashi: *See*—
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Hauer, Kerstin: *See*—
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Hauni-Werke Korber & Co. KG: *See*—
Goldbach, Manfred; Marquardt, Siegfrid; and Myohl, Jochim, 4,693,262, Cl. 131-84.300.
Wahle, Gunter; and Ludszeweit, Dieter, 4,693,263, Cl. 131-84.400.
Hawener, Juergen; and Hain, Klaus, to Dr. h.c.F. Porsche Aktiengesellschaft. Adjusting device for an airplane propulsion systemcu4,693,670, Cl. 416-25.000.
Hawkins, Phillip J.; Kasner, William H.; and Miller, Richard A., to Westinghouse Electric Corp. Laser welding head for sleeve-to-tube weldingcu4,694,137, Cl. 219-121.0LC.
Haworth, Inc.: *See*—
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Hawrylo, Frank Z.: *See*—
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Hay, Robert R.: *See*—
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Hayabuchi, Masahiro: *See*—
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Hayakawa, Toshihiro, to Toyota Jidosha Kabushiki Kaisha. Defroster structure for vehiclecu4,693,416, Cl. 98-2.090.
Hayakawa, Toshiro; Suyama, Takahiro; Takahashi, Kohsei; and Yamamoto, Saburo, to Sharp Kabushiki Kaisha. Apparatus for the growth of semiconductor crystalscu4,693,207, Cl. 118-715.000.
Hayakawa, Toshiro; Suyama, Takahiro; and Yamamoto, Saburo, to Sharp Kabushiki Kaisha. Stripe geometry semiconductor laser devicecu4,694,460, Cl. 372-45.000.
Hayakawa, Yoichi: *See*—
Harada, Yoshiharu; Taga, Yutaka; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, 4,693,143, Cl. 74-866.000.
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Hayashi, Makoto: *See*—
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Hayashi, Yutaka; Mishuku, Toshio; Yamanaka, Mitsuyuki; and Iida, Hideyo, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry; and Taiyo Yuden Co., Ltd. Thin-film solar cellcu4,694,116, Cl. 136-256.000.
Hayashibara, Ken: *See*—
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Hayes, Cecil E., to General Electric Company. Radio frequency field coil for NMRcu4,694,255, Cl. 324-318.000.
Hayes, Kathryn S.: *See*—
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Haynes, Robert W., to Terra International, Inc. Mechanism for and method of agricultural chemical formulationcu4,693,609, Cl. 366-136.000.
Haysen Manufacturing Company: *See*—
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Hazano, Shigeki; Shibagaki, Masahiro; Jyo, Hidetaka; Sensui, Reiichiro; Iwami, Munenori; and Suzuki, Noboru, to Kabushiki Kaisha Toshiba; and Kabushiki Kaisha Tokuda Seisakusho. Apparatus for producing semiconductor devicescu4,693,777, Cl. 156-345.000.
Heath, Peter W., to General Motors Corporation. Thigh support for vehicle seatcu4,693,513, Cl. 297-284.000.
Hebrard, Denis: *See*—
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Hekal, Ihab M., to Continental Can Company, Inc. Lid for a plastic containercu4,693,390, Cl. 220-359.000.
Held, Kurt. Method for continuous heated pressing of material in sheet formcu4,693,859, Cl. 264-112.000.
Helix Technology Corporation: *See*—
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Hellgren, Keijo, to ASEA AB. Forming press of the pressure cell type and a process for changing diaphrams in such a presscu4,693,103, Cl. 72-63.000.
Helpio, Pentti K., to Rauma-Repola OY. Freeze resistant bottom wellcu4,693,202, Cl. 114-74.00A.
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Hemmer, Walter: *See*—
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Hemsath, Klaus H.; and Fu, Being-I, to Hercules Incorporated. Direct fired cylinder dryercu4,693,015, Cl. 34-41.000.
Henders, Siegfried, to Korf Engineering GmbH. Device for continuous castingcu4,693,295, Cl. 164-433.000.
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Henderson, Elvin J. Quick drain assembly for boat enginecu4,693,690, Cl. 440-88.000.
Heng, Jean-Paul; Marmonier, Andre ; Ruiz, Ariel; and Guernet, Henri, to Cgee Alsthom. Electrical screw connectioncu4,693,542, Cl. 439-626.000.
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Henkin, Melvyn L.; and Laby, Jordan M. Hydrotherapy massage method and apparatuscu4,692,950, Cl. 4-542.000.
Hennig, Kurt, to Gebr. Hennig GmbH. Cover arrangementcu4,693,388, Cl. 220-8.000.
Henningsen, Tom; and Gould, Theresa A., to Westinghouse Electric Corp. Apparatus for the controlled transmission of lightcu4,693,545, Cl. 350-96.120.
Henry, Richard T.: *See*—
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Herbert, Adolf, to Hermann Berstorff Maschinenbau GmbH. Method for reducing wastage in a multiple-head extrusion devicecu4,693,855, Cl. 264-40.700.
Hercules Incorporated: *See*—
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Higashi, Akio; Shinada, Haruji; Kawajiri, Kazuhiro; Ono, Yoshihiro; Saitou, Mitsuo; Tamura, Hiroshi; and Ikeda, Mitsuru, 4,694,317, Cl. 357-30.000.
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Ikenaga, Takao: *See—*
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Bettini, John E., 4,693,654, Cl. 411-387.000.
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Imai, Kiyokazu; Shiomi, Tomoo; and Tezuka, Yasuyuki, to Shin-Etsu Chemical Co., Ltd. Novel cellulose derivative, process for preparing the same and sulfur dioxide gas permselective membrane comprising the samecu4,694,077, Cl. 536-92.000.
Imai, Masafumi: *See—*
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Imaizumi, Masaki, to Olympus Optical Co., Ltd. Zoom lens systemcu4,693,566, Cl. 350-427.000.
Imel, Michael T., to Intel Corporation. Seven transistor content addressable memory (CAM) cellcu4,694,425, Cl. 365-49.000.
Imhof, Christian; and Kempf, Gerhard, to Sulzer Brothers Ltd.; and Carl Hamel Spinn-& Zwirnmaschine AG. Doubling machinecu4,693,069, Cl. 57-59.000.
Imhof, Christian: *See—*
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Imperial Chemical Industries PLC: *See—*
Brown, David; Hargreaves, Rodney B.; McLoughlin, Bernard J.; and Mills, Stuart D., 4,694,005, Cl. 514-234.000.
Ina, Kenzoh; Otani, Masatoshi; and Mishima, Kenichi, to Canon Kabushiki Kaisha. Image information processing systemcu4,694,352, Cl. 358-257.000.
Inaba, Yoshiharu, to Fanuc Ltd. Screw-rotating/injection mechanism of injection molding machinecu4,693,676, Cl. 425-145.000.
Incom, Inc.: *See—*
Jeskey, Richard V., 4,693,552, Cl. 350-96.240.
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Anthony, James R.; and Wiseman, Michael A., 4,692,970, Cl. 24-642.000.
Ingersoll, Roger W., to Mobil Oil Corporation. System and method for controlling erosion of a shorelinecu4,693,632, Cl. 405-18.000.
Innings Telecom Inc.: *See—*
Cheung, Edward H., 4,694,483, Cl. 379-34.000.
Ino, Toshio; Maenosono, Tsukasa; Yoshida, Kazuo; Terasaki, Masanori; Kuriwaki, Tetsusho; Koga, Tadao; and Hirado, Miharu, to Daiichi Koshuha Kogyo Kabushiki Kaisha; and Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Induction heating method and apparatus for relieving residual stress in welded joint between main and branch pipescu4,694,131, Cl. 219-10.410.
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Inoue, Junichi: *See—*
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Inoue, Yoshiharu; Tanimoto, Fumio; and Kitano, Hisao, to Nippon Petrochemicals Company Limited. Vinylnorbornyl alcohol and perfume composition containing the samecu4,693,844, Cl. 512-14.000.
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Hirth, Antoine; and Schetter, Klaus-Herbert, 4,694,463, Cl. 372-61.000.
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Sebille, Bernard; Beuzard, Yves; and Demarne, Henri, 4,694,015, Cl. 514-375.000.
Institut Pasteur: *See—*
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Lee, Bernard S.; Tarman, Paul B.; and Punwani, Dharam V., 4,693,682, Cl. 432-15.000.
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Domenik, Stephen L.; Folmsbee, Alan C.; Nguyen, Tai; and Shirgley, David A., 4,694,412, Cl. 364-717.000.
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Intergraph Corporation: *See—*
Williams, Glenn T.; and Thomas, Michael D., 4,693,444, Cl. 248-653.000.
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Cohen, Donald K.; and Yardy, Raymond, 4,694,447, Cl. 369-110.000.
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Rossi, Eva-Maria; and Tietze, Armin R., 4,693,908, Cl. 427-130.000.
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Lu, Jing-Jong; and Wehrmeister, Herbert L., 4,694,016, Cl. 514-380.000.
Young, Vernon V., 4,693,992, Cl. 514-11.000.
International Packaging Machines, Inc.: *See—*
Humphrey, John R., 4,693,049, Cl. 53-64.000.
International Paper Company: *See—*
McFarland, William W.; Gandy, Russell E.; and Churvis, Michael A., 4,693,413, Cl. 229-48.00R.
Iowa State University Research Foundation Inc.: *See—*
Girard, Leon E., 4,692,968, Cl. 24-145.000.
Ishida, Koji: *See—*
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Ishii, Hidekazu; and Kosaka, Chihiro, to Tokyo Electric Co., Ltd. Stepping motor operated positioning device for a ribbon lifter in a printercu4,693,619, Cl. 400-212.000.
Ishikawa, Takakazu, to Ibiden Kabushiki Kaisha. Process or non-electrolytic copper plating for printed circuit boardcu4,693,907, Cl. 427-97.000.
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Itahana, Hiroshi; and Usui, Yoshinori, to Hitachi, Ltd. Apparatus for vapor-cooling a semiconductorcu4,694,323, Cl. 357-82.000.

Ito, Katsu, to Citizen Watch Co. Ltd. Television receiver having a liquid crystal display devicecu4,694,347, Cl. 358-236.000.

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ITT Corporation: *See*—
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ITT Electro Optical Products, a Division of ITT Corporation: *See*—
Porter, David R.; Bowen, James H.; and Holland, John M., 4,694,504, Cl. 455-608.000.

ITT Gilfillan: *See*—
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Reinartz, Hans D., 4,693,083, Cl. 60-547.100.

Ivan, Steve D., to Wickes Manufacturing Company. Cable drum latching and unlatching mechanismcu4,693,453, Cl. 254-323.000.

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Iwamura, Masahiro; and Masuda, Ikuro, to Hitachi, Ltd. Bi-MOS buffer circuitcu4,694,202, Cl. 307-475.000.

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Iwanaga, Kazuyoshi, to Nissan Motor Co., Ltd. Automatic transmission casecu4,693,141, Cl. 74-606.00R.

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Iwasaki, Masami: *See*—
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Iwasaki, Yukio: *See*—
Miura, Kazuhiko; Hattori, Tadashi; Iwasaki, Yukio; Kohama, Tokio; and Kanehara, Kenji, 4,693,116, Cl. 73-204.000.

Iwase, Sumio, to Sony Corporation. Cordless telephonecu4,694,485, Cl. 379-62.000.

Iwase, Takahiro: *See*—
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Jagemberg AG: *See*—
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James, Brian R.; Li-Lee, Chung; Lilga, Michael A.; and Nelson, David A., to Battelle Memorial Institute. Process for recovery of hydrogen and abstraction of sulfurcu4,693,875, Cl. 423-243.000.

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Burke, Ken V.; Jamieson, Jon V.; and Keller, Ernie, 4,693,659, Cl. 414-131.000.

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Hanyu, Susumu, Hara, Kazumasa; Sasano, Akiyoshi; and Koike, Mikio, 4,693,193, Cl. 112-121.110.
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Janson, Stephen: *See*—
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Kasai, Kiyoshi; Hattori, Masayuki; Kikuchi, Osamu; Takeuchi, Hiromi; Hirai, Haruhiro; and Sakurai, Nobuo, 4,694,035, Cl. 524-458.000.
Yanagihara, Kenji; Kimura, Mituo; Niinomi, Masahiro; Nishikawa, Yasuo; and Mukaida, Yoshito, 4,693,799, Cl. 204-165.000.

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Okumoto, Yutaka, 4,693,260, Cl. 131-84.100.
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Jartoux, Pierre, to Freyssinet International (Stup). Devices for prestressing concrete having stretched sinuous cables and the methods for implementing samecu4,693,044, Cl. 52-230.000.

Jason, Barry L., to Motorola, Inc. Current-saving CMOS input buffercu4,694,201, Cl. 307-475.000.

Jeffers, John M.: *See*—
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Jenekhe, Samson A.; and Hansen, Marcia K., to Honeywell Inc. Method of making electroactive heterocyclic aromatic polymerscu4,694,062, Cl. 528-232.000.

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Jensen, Susan: *See*—
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Jeskey, Richard V., to Incom, Inc. Optical apparatuscu4,693,552, Cl. 350-96.240.

JGC Corporation: *See*—
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John Wyeth & Brother Limited: *See*—
Archibald, John L.; Ward, Terence J.; and Opalko, Albert, 4,694,012, Cl. 514-332.000.

Johnsen, Peter B.; and Adams, Michael A., to Monell Chemical Senses Center. Stimulation and enhancement of feeding in herbivorous fishcu4,693,897, Cl. 426-2.000.

Johnson, James A.; Schulz, Richard; and Tomlonovic, Vincent J., to Hiniker Company. Tractor boomcu4,693,331, Cl. 180-135.000.

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Blatherwick, William J.; Hamilton, Leslie; Holewinski, Robert D.; Shen, Virginia A.; Kapec, Jeffrey; and Tanaka, Kazuna, 4,693,684, Cl. 433-90.000.

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Johnson, Robert E.: *See*—
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Johnson, Robert W., Jr., to Union Camp Corporation. Method of preparing hot-melt stable rosin ester with organic ester of hypophosphorous acid catalystcu4,693,847, Cl. 260-104.000.

Johnson, Roy S. Windshield attachment clipcu4,692,969, Cl. 24-573.000.

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Jones, Howard: *See*—
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Jones, Ronald E.; and Peterson, Royal D., to Continental Laser Corporation. Laser with bypass gas deflectorcu4,694,462, Cl. 372-61.000.

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Joyce International, Inc.: *See*—
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Jozefczak, Thadius F., to General Motors Corporation. Check and control for a sliding doorcu4,692,960, Cl. 16-86.00A.

Juda, Robert H.; Crawford, Roger A.; and Chakrabarti, Paritosh M., to PPG Industries, Inc. Halophor compositioncu4,693,894, Cl. 424-150.000.

Judd, Richard K.: *See*—
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Juengel, Richard O., to GTE Valeron Corporation. Method and apparatus for testing the operability of a probecu4,693,110, Cl. 73-1.00R.

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Julius Blum Gesellschaft m.b.H.: *See*—
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Jurga, Stanley M., to George Frost Company. Baseball catcher's leg guardcu4,692,946, Cl. 2-22.000.

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Kabatnik, Wilfried: *See*—
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Saito, Tutomu; and Yoneda, Hitoshi, 4,694,310, Cl. 346-153.100.
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Tamura, Hiroshi; and Nakaie, Yutaka, 4,694,282, Cl. 340-539.000.
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Kakuda, Yoshiaki; Wakahara, Yasushi; and Norigoe, Masamitsu, to Kokusai Denshin Denwa Co., Ltd. Protocol validation systemcu4,694,422, Cl. 364-900.000.

Kalen, David D., to Babcock & Wilcox Company, The. Reactor internals core barrel hole plugcu4,693,389, Cl. 220-236.000.

Kali-Chemie Aktiengesellschaft: *See*—
Willenberg, Heinrich; Pohlmeyer, Wilhelm; and Rudolph, Werner, 4,694,112, Cl. 568-842.000.

Kallstrom, Leif A.: *See*—
Axelsson, Bengt I.; Brattsand, Ralph L.; Dahlback, Carl M. O.; Kallstrom, Leif A.; and Trofast, Jan W., 4,693,999, Cl. 514-174.000.

Kalnajs, Janis I.: *See*—
Kuper, Nina M.; and Kalnajs, Janis I., 4,693,924, Cl. 428-170.000.

Kamata, Yoshikiyo, to Kioritz Corporation. Vibration dampercu4,693,457, Cl. 267-153.000.

Kamei, Eiichi; Namba, Hideaki; and Ohba, Masahiro, to Nippondenso Co., Ltd. Vehicle height control apparatuscu4,693,485, Cl. 280-6.00R.

Kametaka, Kenichi: *See*—
Umeyama, Mitsuhiro; Wakahara, Kaoru; Ohtani, Kisao; Kametaka, Kenichi; Kinoshita, Masaru; and Kobayashi, Nobuyuki, 4,693,354, Cl. 192-106.100.

Kamiya, Kiyoshi; Shiraishi, Atsushi; and Suzuki, Fuminori, to Citizen Watch Co., Ltd. Method of driving liquid crystal display panel of TV receivercu4,694,348, Cl. 358-236.000.

Kamiya, Shingo: *See*—
Tomisawa, Norio; Kamiya, Shingo; and Aoshima, Shinji, 4,694,441, Cl. 369-32.000.

Kamuro, Setsufumi: *See*—
Hirano, Takaaki; Kamuro, Setsufumi; Yamaguchi, Akira; Tanimoto, Junichi; and Okada, Mikiro, 4,694,393, Cl. 364-200.000.

Kanasugi, Mikiko: *See*—
Kaneko, Kazuo; Suzuka, Susumu; Gonda, Michihiro; and Kanasugi, Mikiko, 4,694,088, Cl. 549-226.000.

Kanda, Ryouji, to Tokai Rubber Industries, Ltd. Fluid-filled resilient bushing with circumferential orificecu4,693,456, Cl. 267-140.100.

Kando, Yasuhiko: *See*—
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Kanegaguchi Kagaku Kogyo Kabushiki Kaisha: *See*—
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Kanehara, Kenji: *See*—
Miura, Kazuhiko; Hattori, Tadashi; Iwasaki, Yukio; Kohama, Tokio; and Kanehara, Kenji, 4,693,116, Cl. 73-204.000.

Kaneko, Kazuo; Suzuka, Susumu; Gonda, Michihiro; and Kanasugi, Mikiko, to Hodogaya Chemical Co., Ltd. Fluoran compoundscu4,694,088, Cl. 549-226.000.

Kankyo Company Limited: *See*—
Fuzimura, Yasuyuki, 4,693,733, Cl. 55-129.000.

Kansai Electric Power Co., Inc., The: *See*—
Haraguchi, Eiji; Nakagawa, Hiroto; Bando, Akira; Kuwahara, Takao; Nohara, Haruo; and Ono, Kenichi, 4,694,189, Cl. 290-40.00C.

Kanto Chemical Co., Ltd.: *See*—
Hirai, Yoichi; Fujii, Tsunenori; Koto, Kaoru; Suzuki, Kenji; Yoshida, Masahiro; Okawa, Hisashi; Okabe, Yoshiaki; Kitamura, Teruo; Yokokura, Hisao; Hattori, Shintaroo; Mukoh, Akio; and Sato, Mikio, 4,694,098, Cl. 560-59.000.

Kanto Ishi Pharmaceutical Co., Ltd.: *See*—
Ogawa, Tomoya; Sugimoto, Mamoru; Shitori, Yoshiyasu; and Ito, Masayoshi, 4,694,076, Cl. 536-17.200.

KAO Corporation: *See*—
Fujikura, Yoshiaki; Yamamuro, Akira; and Nakajima, Motoki, 4,693,845, Cl. 512-9.000.
Kuwamoto, Hiroshi; Iwadoo, Shuichi; Okami, Yuji; Nagamori, Hiroyuki; and Nakagawa, Yasuhiro, 4,693,839, Cl. 252-51.50A.

Kapec, Jeffrey: *See*—
Blatherwick, William J.; Hamilton, Leslie; Holewinski, Robert D.; Shen, Virginia A.; Kapec, Jeffrey; and Tanaka, Kazuna, 4,693,684, Cl. 433-90.000.

Karavolis, Sam: *See*—
Setzer, Herbert J.; Karavolis, Sam; and Bett, John A. S., 4,693,882, Cl. 423-652.000.

Kariya, Akinori; Nabekawa, Shukichi; Hara, Yoshifusa; and Taguchi, Junji, to Hironori Kushibiki; and Nippon Chemical Industrial Co., Ltd. Phosphoric acid dithioesters, and insecticides containing said dithioesterscu4,694,095, Cl. 558-186.000.

Karlsson, Gosta, to B & D Autolines AB. Method and apparatus for dividing and further treatment of units of goodscu4,693,154, Cl. 83-161.000.

Karnel Corporation: *See*—
Stauffer, Nelson R., 4,693,766, Cl. 156-64.000.

Karth, Beat: *See*—
Lamping, Alfons; and Karth, Beat, 4,693,385, Cl. 215-232.000.

Kasai, Junichi; Imai, Hiroshi; and Tsuda, Hiroshi, to Nissan Motor Company, Limited. Automotive multi-speaker audio system with automatic echo-control featurecu4,694,497, Cl. 381-63.000.

Kasai, Kiyoshi; Hattori, Masayuki; Kikuchi, Osamu; Takeuchi, Hiromi; Hirai, Haruhiro; and Sakurai, Nobuo, to Japan Synthetic Rubber Co., Ltd. Process for preparing large-sized polymer particlescu4,694,035, Cl. 524-458.000.

Kasanami, Toru; Tani, Hiroji; Watanabe, Shizuharu; and Ikeda, Toshiaki, to Murata Manufacturing Co., Ltd. Resistance pastecu4,693,843, Cl. 252-518.000.

Kashy, David H.: *See*—
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Kasner, William H.; Bruck, Gerald J.; Miller, Richard A.; and Toth, Vincent A., to Westinghouse Electric Corp. Laser welding of a sleeve within a tubecu4,694,136, Cl. 219-121.0LD.

Kasner, William H.: *See*—
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Kaspar Wire Works, Inc.: *See*—
Aschenbeck, Weldon J.; and Medley, Frank W., III, 4,693,357, Cl. 194-202.000.

Kassis, Amin I. Pool vacuumcu4,692,956, Cl. 15-1.700.

Kastrop, Dieter: *See*—
Grzanna, Ortwin; Koesfeld, Manfred; Weber, Rolf-Udo; Steuer, Aloysius; Romswinkel, Horst; Fremgen, Dieter; and Kastrop, Dieter, 4,693,767, Cl. 156-49.000.

Kastrup, Dieter: *See*—
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Kasuya, Takahira: *See*—
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Katagiri, Kazuharu: *See*—
Takasu, Yoshio; Oguchi, Yoshihiro; and Katagiri, Kazuharu, 4,693,951, Cl. 430-31.000.

Kataoka, Hiroshi. Winding shaft for sheet rewindercu4,693,431, Cl. 242-72.00B.

Katayama, Takao, to Kubota, Ltd. Grass collection bag for lawn mowercu4,693,064, Cl. 56-202.000.

Katecho, Incorporated: *See*—
Scharnberg, Lorne C.; and Devanathan, Deva, 4,693,720, Cl. 623-11.000.

Kato, Masayuki: *See*—
Suzuki, Shinichi; Tokamo, Akio; Kunugi, Yoshiro; and Kato, Masayuki, 4,694,498, Cl. 381-103.000.
Kato, Shigeru: *See*—
Nakaho, Junichi; Kato, Shigeru; and Shibahara, Makoto, 4,693,558, Cl. 350-332.000.
Kato, Toshiyuki: *See*—
Shiomi, Kengo; Sasaki, Yoshiyuki; and Kato, Toshiyuki, 4,694,305, Cl. 346-76.0PH.
Kato, Yoshihisa: *See*—
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Katoh, Shinji: *See*—
Miyata, Hiroshi; and Katoh, Shinji, 4,693,332, Cl. 180-142.000.
Katsuda, Yoshio; Yoshinaga, Sadao; and Mashine, Hiroyoshi, to Dainihon Jochugiku Co., Ltd. Thermal fumigator for drugscu4,693,868, Cl. 422-124.000.
Katsuno, Toshiyasu: *See*—
Chujo, Yoshiki; Kayanuma, Nobuaki; Bessho, Hironori; Masui, Takatoshi; Nagai, Toshinari; Katsuno, Toshiyasu; and Tanahashi, Toshio, 4,693,076, Cl. 60-274.000.
Katz, Ira: *See*—
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,693,890, Cl. 424-78.000.
Kawaguchi, Katsuhiko, to Tokyo Electric Co., Ltd. Paper loading device of printercu4,693,621, Cl. 400-636.100.
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Kawai, Hisasi: *See*—
Tokura, Norihito; Moritugu, Mitiyasu; and Kawai, Hisasi, 4,693,115, Cl. 73-204.000.
Kawai, Masao: *See*—
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Kawai, Noriaki: *See*—
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Kawai, Yasuhiro: *See*—
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Kawai, Yoshio: *See*—
Nakaguti, Osamu; Shimazaki, Norihiko; Kawai, Yoshio; Hashimoto, Masashi; and Nakatuka, Michie, 4,694,004, Cl. 514-228.000.
Kawajiri, Kazuhiro: *See*—
Higashi, Akio; Shinada, Haruji; Kawajiri, Kazuhiro; Ono, Yoshihiro; Saitou, Mitsuo; Tamura, Hiroshi; and Ikeda, Mitsuru, 4,694,317, Cl. 357-30.000.
Kawakami, Kenji: *See*—
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Kawakami, Seiho: *See*—
Takeshita, Hajime; Iwase, Takahiro; Masuda, Naofumi; Sibata, Takuo; Mochizuki, Hiroyuki; Kobayashi, Nobuo; Kawakami, Seiho; and Kuroiwa, Yosio, 4,693,813, Cl. 409-244.000.
Kawamoto, Minoru: *See*—
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Kawamura, Keiichi, to Fuji Photo Film Co., Ltd. Compensation circuit for pulse signalscu4,694,256, Cl. 328-120.000.
Kawamura, Masaharu; and Hiramatsu, Akira, to Canon Kabushiki Kaisha. Auxiliary light source for camera having automatic focusing devicecu4,693,582, Cl. 354-403.000.
Kawamura, Seijiro: *See*—
Taki, Masaru; Okada, Hiroshi; Kawamura, Seijiro; Kusumoto, Akio; Morita, Koji; Ikenaga, Takao; Shigematsu, Toshifumi; and Iida, Masami, 4,692,951, Cl. 4-664.000.
Kawamura, Toshimi; Yamada, Tadatoshi; Hani, Kiyoshi; and Yoshizaki, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Superconducting solenoid having alumina fiber insulatorcu4,694,268, Cl. 335-216.000.
Kawasaki Thermal Systems, Inc.: *See*—
Stephenson, Edgar O.; and Howe, Raymond C., 4,693,313, Cl. 166-302.000.
Kawasaki, Tsutomu: *See*—
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Kawashima, Norimichi: *See*—
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Kawazoe, Hiromitsu: *See*—
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Kawazoye, Yutaka: *See*—
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Keem, John E.; Ovshinsky, Stanford R.; Flessa, Steven A.; Wood, James L.; Hart, Keith L.; and Sztaba, Lennard, to Ovonic Synthetic Materials Company, Inc. X-ray dispersive and reflective structures and method of making the structurescu4,693,933, Cl. 428-333.000.
Keesen, Heinz-Werner; Oberjatzas, Gunter; and Peters, Hartmut, to Telefunken Fernseh und Rundfunk GmbH. Digital data transmission methodcu4,694,336, Cl. 358-133.000.
Keijzer, Paulus P. M.: *See*—
Muijs, Herman M.; and Keijzer, Paulus P. M., 4,693,311, Cl. 166-272.000.
Keilhau, Karl F. Racket having rotatably adjustable handlecu4,693,475, Cl. 273-73.00J.
Kelco International Limited: *See*—
Clare, Kenneth; and Gibson, William, 4,693,728, Cl. 8-561.000.
Keller, Ernie: *See*—
Burke, Ken V.; Jamieson, Jon V.; and Keller, Ernie, 4,693,659, Cl. 414-131.000.
Keller, James H. Camera supportcu4,693,575, Cl. 354-82.000.
Kellett, James H.; Gaddis, Raymond W.; Fritts, Robert W.; and Schoenecker, David L., to Douglas Battery Manufacturing Co. Storage battery housingcu4,693,949, Cl. 429-178.000.
Kelly, John C.; and Kentwell, Glenn W., to Unisearch Limited. Methods of steering and focusing ion and electron beamscu4,694,457, Cl. 372-2.000.
Kemmerer, Klemens; Gensheimer, Valentin; and Melzer, Rudolf, to M. A. N. Roland Druckmaschinen Aktiengesellschaft. Chain conveyor for the delivery device of printing pressescu4,693,362, Cl. 198-803.700.
Kempf, Gerhard: *See*—
Imhof, Christian; and Kempf, Gerhard, 4,693,069, Cl. 57-59.000.
Kenco Engineering Company: *See*—
Mills, Stephen K., 4,693,117, Cl. 73-326.000.
Kendall Company, The: *See*—
Bates, David, 4,693,712, Cl. 604-323.000.
Dye, John F., 4,693,707, Cl. 604-111.000.
Rosenberg, Helmut W. G., 4,693,703, Cl. 604-49.000.
Shah, Kishore R., 4,693,887, Cl. 424-19.000.
Kennametal, Inc.: *See*—
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Kennecott Corporation: *See*—
Boecker, Wolfgang D. G.; and Korzekwa, Tadeusz M., 4,693,988, Cl. 501-89.000.
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham A., to Buddy L Corporation. Toy crash vehiclecu4,693,693, Cl. 446-6.000.
Kennette, John W.: *See*—
Buyofsky, Conrad C.; and Kennette, John W., 4,693,922, Cl. 428-134.000.
Kent, Roger S., to E.R.G. Management Services Pty., Ltd. Display membercu4,694,289, Cl. 340-815.050.
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Kelly, John C.; and Kentwell, Glenn W., 4,694,457, Cl. 372-2.000.
Keogh, Raymond J.: *See*—
Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; and Crowell, Jonathan C., 4,693,778, Cl. 156-361.000.
Kerdix, Inc.: *See*—
Muchnik, Boris J.; and Spong, Fred W., 4,694,358, Cl. 360-59.000.
Kerherve, Jean-Pierre; and Queromes, Armel, to Saint Gobain Vitrage. Method for preparing a dibutyl tin difluoride powder for coating a substratecu4,694,091, Cl. 556-104.000.
Kernforschungszentrum Karlsruhe GmbH: *See*—
Becker, Erwin; Ehrfeld, Wolfgang; and Hagmann, Peter, 4,693,791, Cl. 204-11.000.
Kerttula, Reima: *See*—
Aula, Jouko; and Kerttula, Reima, 4,693,784, Cl. 162-202.000.
Kevex Corporation: *See*—
Skillicorn, Brian, 4,694,480, Cl. 378-119.000.
Key Bank N.A.: *See*—
Meagher, Donald J. R., 4,694,404, Cl. 364-518.000.
Khachikian, Harry. Spoileron control mechanismcu4,693,437, Cl. 244-225.000.
Kidde Recreation Products, Inc.: *See*—
Simonds, Gary; Jennings, Thomas P.; and Gallops, Henry, 4,693,228, Cl. 124-25.000.
Kikuchi, Kazuya; Komeda, Tadao; and Fujita, Tsutomu, to Matsushita Electric Industrial Co., Ltd. Fabrication method of semiconductor devicecu4,693,782, Cl. 156-653.000.
Kikuchi, Mitsuo: *See*—
Seita, Toru; Satoh, Takao; and Kikuchi, Mitsuo, 4,693,796, Cl. 204-98.000.
Kikuchi, Osamu: *See*—
Kasai, Kiyoshi; Hattori, Masayuki; Kikuchi, Osamu; Takeuchi, Hiromi; Hirai, Haruhiro; and Sakurai, Nobuo, 4,694,035, Cl. 524-458.000.
Killip, Graham R.; Camp, Ronnie W.; and Orr, Clyde, Jr., to Micromeritics Instrument Co. Temperature controlling apparatus for use with pore volume and surface area analyzerscu4,693,124, Cl. 73-863.110.
Kim, Sun K. Sports shoe protectorcu4,693,019, Cl. 36-7.300.
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Yanagihara, Kenji; Kimura, Mituo; Niinomi, Masahiro; Nishikawa, Yasuo; and Mukaida, Yoshito, 4,693,799, Cl. 204-165.000.
Kimura, Sakae; and Tanaka, Yasuhiro, to Kabushiki Kaisha Matsuyama Seisakusho. Support and drive unit for mirror devicescu4,693,571, Cl. 350-634.000.
Kinetico. Inc.: *See*—
Brown, Keith E., 4,693,814, Cl. 210-88.000.

King Jim Co., Ltd.: *See*—
Ohminato, Kiyoshi, 4,693,625, Cl. 402-27.000.
King, Patrick D., to Flo-Con Systems, Inc. Composite break ring for continuous castingcu4,693,296, Cl. 164-440.000.
King, William L.; and Weisbart, Charles K., to Samsonite Corporation. Combination garment bag and packing case luggage articlecu4,693,368, Cl. 206-287.100.
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Kinjo, Hisao, to Victor Company of Japan. Recording medium for recording and/or reproducing apparatuscu4,694,365, Cl. 360-100.000.
Kinkel, Horst. Method for erecting a bridge superstructure of prestressed concrete and launching girder for performing the samecu4,692,955, Cl. 14-17.000.
Kinoshita, Katsuyuki, to Hamamatsu Photonics Kabushiki Kaisha. High-speed frame pick-up cameracu4,694,220, Cl. 315-10.000.
Kinoshita, Masaru: *See*—
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Kirchhoff, Pamela M.: *See*—
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Kirst, Bertold; Beyer, Otto; and Lipp, Wolfgang, to Litef GmbH. Method and apparatus for aiming indirectly aimable weaponscu4,693,168, Cl. 89-41.110.
Kishi, Hiroyoshi; and Matsushima, Masaaki, to Canon Kabushiki Kaisha. Magnetooptical recording mediumcu4,693,943, Cl. 428-678.000.
Kishiro, Nobuo: *See*—
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Kita, Yasuo: *See*—
Morita, Hideyo; Akagawa, Tomohiko; and Kita, Yasuo, 4,694,031, Cl. 523-203.000.
Kitagawa, Katsuichi; and Tamura, Kouichi, to Toray Industries, Inc. Method and apparatus for determining position of points on articlecu4,693,608, Cl. 356-394.000.
Kitagawa, Masaru: *See*—
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Kitzmann, Ronald A.; and Tchejeyan, Sarkis K., to General Motors Corporation. Illuminated pushbutton switch with unitary spring and contactcu4,694,130, Cl. 200-314.000.
Kjeldsen, Ingomar. Three-dimensional duplicating milling machinecu4,693,645, Cl. 409-86.000.
Klees, Kevin J., to Eastman Kodak Company. Spatial filter useful for removing noise from video images and for preserving detail thereincu4,694,342, Cl. 358-167.000.
Klein, Gerhard: *See*—
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Meier, Helmut-Martin; Dhein, Rolf; Winkel, Jens; Klein, Gerhard; and Kloker, Werner, 4,694,041, Cl. 525-25.000.
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Klein, Robert A. Side facing backrest for boatscu4,693,204, Cl. 114-363.000.
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Klomp, Edward D., to General Motors Corporation. Air-assist fuel injection nozzlecu4,693,420, Cl. 239-87.000.
Kloss, Gerhard: *See*—
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Kobayashi, Shigeyoshi; Manabe, Tsuneo; and Yanagisawa, Ichiro, to Asahi Glass Company Ltd. Composition for staining materialcu4,693,748, Cl. 106-35.000.
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Koga, Keiichiro, to Kokusai Denshin Denwa Co., Ltd. Decoding method for multiple bit error correction BCH codescu4,694,455, Cl. 371-37.000.
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Koike, Eishi, to Ozen Corporation. Record disc replacing meanscu4,694,444, Cl. 369-65.000.
Koike, Eishi, to Ozen Corporation. Record disc replacing means for a selective playing type sound reproducing devicecu4,694,445, Cl. 369-65.000.
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Kondis, Tom. Aluminum particles resistant to reaction with watercu4,693,754, Cl. 106-290.000.
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Kono, Toshiaki: *See*—
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Korf Engineering GmbH: *See*—
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Korzekwa, Tadeusz M.: *See*—
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Kovacs, Julius S. Bend following plumbers snakecu4,692,957, Cl. 15-104.3SN.
Kovacs, Lloyd, to Hayssen Manufacturing Company. Bag sealing barcu4,693,058, Cl. 53-552.000.
Kowalski, Joseph C.; Mottaz, Donald A.; and Cole, Berton A., to Boeing Company, The. Flexible, fire-resistant, decorative laminates and methods of manufacture thereofcu4,693,926, Cl. 428-204.000.
Koyama, Atsuo: *See*—
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Krampe, Stephen E.; Moore, Cheryl L.; and Taylor, Charles W., to Minnesota Mining and Manufacturing Company. Macromer reinforced pressure sensitive skin adhesivecu4,693,776, Cl. 156-327.000.
Kraus, Charles E., to Excelermatic Inc. High-powered vehicle drive traincu4,693,134, Cl. 74-690.000.
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Krepski, Larry R.; Smith, Howell K., II; Rasmussen, Jerald K.; and Heilmann, Steven M., to Minnesota Mining and Manufacturing Company. Method of preparing N-acryloyl-α-amino acidscu4,694,103, Cl. 562-450.000.

Kristola, Osvald; and Korpela, Paavo, to ASEA Aktiebolag. Method and installation for fitting nuts to a workpiececu4,692,983, Cl. 29-432.000.

Krummenauer, Hans: *See*—
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Krutz, Gary W.; and Kruse, James W., to Outdoor Electronics, Ltd. Force detecting and indicating apparatus for fishing rodscu4,693,125, Cl. 73-862.390.

Kryder, Ralph W. Sports training apparatuscu4,693,570, Cl. 350-616.000.

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Kubota, Ltd.: *See*—
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Kuehnert, Egbert, to Hoechst Aktiengesellschaft. Control device and process for aligning an endless belt utilizing the control devicecu4,693,363, Cl. 198-807.000.

Kuhn S.A.: *See*—
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Kunikawa, Norihide; Kondo, Tetsuya; Ohba, Yasumasa; and Matsuoka, Michihiro, to Sharp Kabushiki. Method of controlling a stop position of an optical system in a copying machinecu4,693,595, Cl. 355-77.000.

Kuno, Akira: *See*—
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Kunugi, Yoshiro: *See*—
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Kuo, Richard J.; Mackay, John W.; and Van Buren, Rick L., to Minnesota Mining and Manufacturing Company. Smooth, low-friction magnetic recording mediumcu4,693,930, Cl. 428-323.000.

Kuper, Nina M.; and Kalnajs, Janis I. Decorative tilecu4,693,924, Cl. 428-170.000.

Kupper, Karl H., to U.S. Philips Corporation. Device for filtering a high-frequency conductor susceptible to electromagnetic interference of a high-frequency spacecu4,694,265, Cl. 333-185.000.

Kuramoto, Akio: *See*—
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Kuraray Co., Ltd.: *See*—
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Kuribayashi, Tetsuzo: *See*—
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Kuriwaki, Tetsusho: *See*—
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Kurlytis, Paul C.; and Carpenter, Clayton A. Exercise machine having pedals which extend radially against resistive meanscu4,693,468, Cl. 272-73.000.

Kuroda Precision Industries Ltd.: *See*—
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Kuroda, Yuji: *See*—
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Kuroki, Yoichi: *See*—
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Kurosaki Refractories Co., Ltd.: *See*—
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Kurpan, Vincent E., to Eastman Kodak Company. Patch generator for an electrophotographic devicecu4,693,592, Cl. 355-14.00E.

Kusaka, Teruo, to NEC Corporation. Thyristor having a controllable gate trigger currentcu4,694,319, Cl. 357-38.000.

Kusumoto, Akio: *See*—
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Kusunoki, Shigeru: *See*—
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Kuwahara, Hideo: *See*—
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Kuwahara, Takao: *See*—
Haraguchi, Eiji; Nakagawa, Hiroto; Bando, Akira; Kuwahara, Takao; Nohara, Haruo; and Ono, Kenichi, 4,694,189, Cl. 290-40.00C.

Kuwamoto, Hiroshi; Iwadoo, Shuichi; Okami, Yuji; Nagamori, Hiroyuki; and Nakagawa, Yasuhiro, to Kao Corporation; and Nippon Kokan Kabushiki Kaisha. Metal rolling oil compositioncu4,693,839, Cl. 252-51.50A.

Kuze, Katsuaki; Nishino, Yasuhiro; Matsuyama, Yujiro; Maeda, Kozo; Kobayashi, Masahiro; Okudaira, Tadashi; Hongo, Tsuyoshi; and Makimura, Osamu, to Toyo Boseki Kabushiki Kaisha. Oriented polyester filmcu4,693,932, Cl. 428-323.000.

Kuznetsov, Stephen B.; and Nathenson, Richard D., to Westinghouse Electric Corp. Continuous metal casting apparatuscu4,693,299, Cl. 164-502.000.

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Kyoto, Michihisa: *See*—
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Kyriakis, John. Non-contact temperature measurement of a static or moving targetcu4,693,615, Cl. 374-129.000.

Laakso, Oliver A. Digester having plural screens and means for controlling the liquid withdrawalcu4,693,785, Cl. 162-242.000.

Labelette Company: *See*—
Wesley, James G., 4,693,774, Cl. 156-215.000.

Laby, Jordan M.: *See*—
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LaCroix, Lloyd A. Scissor lift and transportcu4,693,660, Cl. 414-458.000.

Lagin, Herbert. Clothes hanging system and theft-proof shipping systemcu4,693,369, Cl. 206-290.000.

Lagow, Ralph J., to Thermal Engine Technology, Inc. Method of generating power from a vaporcu4,693,087, Cl. 60-670.000.

Lahm, George P., to Du Pont de Nemours, E. I., and Company. Insecticidal and acaricidal phenoxypyrdinyl esters and intermediatescu4,694,013, Cl. 514-345.000.

Lahtinen, Leila: *See*—
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Laitram Corporation, The: *See*—
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Lalonde, Albert. Refreshment cup holdercu4,693,440, Cl. 248-154.000.

Lamb, Owen L.; and Maclay, William R., to Slide Management Systems, Inc. Slide archival storage and retrieval systemcu4,693,373, Cl. 209-3.300.

Lamping, Alfons; and Karth, Beat, to Nyffeler Corti. Sterilization-resistant glass container sealed with an aluminum composite filmcu4,693,385, Cl. 215-232.000.

Land, John M., to Cook Paint and Varnish Company. Hybrid photocure systemcu4,694,029, Cl. 522-8.000.

Landin, Pedro: *See*—
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Lane, Bruce B.; Westerkamp, Douglas F.; and Clifford, Peter P., to General Electric Company. Integral generator housing and base for a turbine generatorcu4,694,190, Cl. 290-52.000.

Lang, David J.; Layer, John C.; and Durtschi, William G., to Sundstrand Corporation. Clutch mechanismcu4,693,352, Cl. 192-70.270.

Lang, Hans-Jorg, to Ludwig Schwerdtel GmbH. Dosing devices for viscous materials particularly highly viscous materialscu4,693,397, Cl. 222-137.000.

Lang, Jack: *See*—
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Langford, Gordon B.: *See*—
Aiken, Hugh H., Jr.; and Langford, Gordon B., 4,694,126, Cl. 200-5.00A.

Langley, Robert; Stewart, John D.; and Walls, Arthur S., to Ciba-Geigy Corporation. Production of pigmentary copper phthalocyaninecu4,694,078, Cl. 540-141.000.

Languillat, Jean-Paul; Morel, Jean-Michel; and Queyrat, Jacques, to Lhomme S.A. Protective device and method for forming protective device and use of protective device as a package and apparatus for forming protective devicecu4,693,919, Cl. 428-36.000.

Lapeyre, James M., to Laitram Corporation, The. Mold and process for manufacturing helical shaped itemscu4,693,861, Cl. 264-328.100.

LaPointe, Virginia L. Shoulder belt cushioncu4,693,495, Cl. 280-808.000.

LaRocca, William J.; and Trush, David M., to Wickes Manufacturing Company. Manually operable gearshift mechanismcu4,693,135, Cl. 74-473.00R.

Laser Magnetic Storage International Company: *See*—
Carickhoff, Richard C.; Hemdal, Hakan O.; and Schultz, Alvin L., 4,694,259, Cl. 331-1.00A.

Laser Therapeutics, Inc.: *See*—
McCaughan, James S., Jr., 4,693,556, Cl. 350-320.000.

Latge, Christian, to Commissariat a l'Energie Atomique. Cold trap for eliminating impurities from a polluted liquid metalcu4,693,088, Cl. 62-55.500.

Laue, Frank: *See*—
Stetter, Karl O.; Schmitt, Rudiger; and Laue, Frank, 4,693,980, Cl. 435-199.000.

Laurel Bank Machines Co., Ltd.: *See*—
Honma, Nobuyuki, 4,693,464, Cl. 271-265.000.

Lavely, Daniel, to Rockwell International Corporation. Rod actuator for automatic slack adjusting mechanismscu4,693,342, Cl. 188-79.50K.

Law, Kirk A.; and Harwood, Leopold A., to RCA Corporation. Vertical transition processor for a comb filtercu4,694,331, Cl. 358-31.000.

Layer, John C.: *See*—
Lang, David J.; Layer, John C.; and Durtschi, William G., 4,693,352, Cl. 192-70.270.

Lazcano-Navarro, Arturo; Alcantara, Miguel A.; and Hernandez-Ruiz, Jose E., to Instituto Mexicano De Investigaciones Siderurgicas. Device for the selective injection of an oxidizing gas or a carrier gas with or without carbonaceous material to a liquid metal bathcu4,693,274, Cl. 137-625.400.

Lear Siegler, Inc.: *See*—
Pierce, William C.; and Smith, John P., 4,693,486, Cl. 280-80.00R.

Le Beyec, Yvon; and Negra, Serge D., to Centre National de la Recherche Scientifique. Time-of-flight mass spectrometercu4,694,168, Cl. 250-287.000.

Lebrun, Jean-Jacques: *See*—
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Lederer, Edgar: *See*—
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Ledford, Hazen, Jr. Table saw attachment for cutting circlescu4,693,155, Cl. 83-410.000.

Lee, Anthony: *See*—
Nagel, Gregory L.; Sidlosky, David M.; Murty, Balarama V.; Lee, Anthony; and Cleveland, Dixon, 4,694,135, Cl. 219-110.000.

Lee, Bernard S.; Tarman, Paul B.; and Punwani, Dharam V., to Institute of Gas Technology. Treatment of solids in fluidized bed burnercu4,693,682, Cl. 432-15.000.

Lee, Cheng F. Wind-bellcu4,693,162, Cl. 84-404.000.

Lee, James N.: *See*—
Riederer, Stephen J.; Wright, Ronald C.; and Lee, James N., 4,694,252, Cl. 324-309.000.

Lee, Robert A. S., to Electric Power Research Institute, Inc. Microprocessor-based control and diagnostic system for motor operated valvescu4,694,390, Cl. 364-165.000.

Lee, Robert L. Dental apparatus and method of usecu4,693,683, Cl. 433-37.000.

Lee, Roy, Jr. Method of and apparatus for straightening, swaging, and threading a pipecu4,693,105, Cl. 72-84.000.

Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Chedid, Louis; Choay, Jean; and Lederer, Edgar, to Agence Nationale de Valorisation de la Recherche. Novel compounds of the muramyl peptidecu4,693,998, Cl. 514-62.000.

Legras, Yvonne: *See*—
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Lehigh University: *See*—
Schwartz, Anthony M.; Kawashima, Norimichi; and Zettlemoyer, Albert C., 4,693,958, Cl. 430-302.000.

Lehman, Michael E., to Monorail, Inc. Microprocessor based air inflation control systemcu4,694,409, Cl. 364-558.000.

Lehmann, Hans; and Zahir, Abdul-Cader, to Ciba-Geigy Corporation. (Acylthiopropyl)phenolscu4,694,096, Cl. 558-251.000.

Leicht, John L., to Motorola, Inc. Apparatus for dispensing solder pastecu4,693,209, Cl. 118-213.000.

Leistikow, Keith A.: *See*—
Hoepfner, Thomas L.; and Leistikow, Keith A., 4,693,063, Cl. 56-16.600.

Lenderman, Gary L., to Nalco Chemical Company. Method of utilizing paraffin inhibitorscu4,693,312, Cl. 166-279.000.

Lenney, William E., to Air Products and Chemicals, Inc. Pressure sensitive adhesives prepared by polymerization in the presence of ethoxylated acetylenic tertiary glycolcu4,694,056, Cl. 526-202.000.

Lentz, Gerhard: *See*—
Bohm, August; Lentz, Gerhard; and Wilkens, Gunter, 4,693,761, Cl. 148-9.00R.

Lenz, Herman N.; and Chen, Allen G., to Teledyne Industries, Inc. Turbine inlet nozzle with cooling meanscu4,693,667, Cl. 415-115.000.

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Colleran, Stephen A.; and Lenz, William R., 4,693,532, Cl. 439-594.000.

Leonetti, Frank A.: *See*—
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Leonetti, Fred L.; Leonetti, Richard L.; and Leonetti, Frank A. Elastomeric coating removal processcu4,693,496, Cl. 283-102.000.

Leonetti, Richard L.: *See*—
Leonetti, Fred L.; Leonetti, Richard L.; and Leonetti, Frank A., 4,693,496, Cl. 283-102.000.

Leonhard, Rolf: *See*—
Dettling, Hubert; Haag, Gottlob; Hagele, Karl-Heinz; Leonhard, Rolf; and Polach, Wilhelm, 4,693,078, Cl. 60-295.000.

Leprevost, Leonardo. Closure appliance for use in connection with surgical ostomycu4,693,236, Cl. 128-1.00R.

Le Roux, Patrick, to Thomson-CGR. Process for the modulation of the speed effect of moving parts of a body in a nuclear magnetic resonance density measurement and performance of the process in order to deduce therefrom the speed of the moving parts in questioncu4,694,253, Cl. 324-309.000.

Les Exploitfs Nordex Ltee/Nordex Explosives Ltd.: *See*—
Ross, Cyrus A.; and Thurow, Eberhard, 4,693,763, Cl. 149-8.000.

Les Industries Fortier Ltee: *See*—
Daigle, Clement; and Gonthier, Emile, 4,693,482, Cl. 277-207.00A.

Lescoe, Paul J.; and Scheffler, Charles E., to United States of America, Army. Fire suppression test apparatuscu4,693,320, Cl. 169-61.000.

Leser, Jacques, to Verrerie du Languedoc et Cie. Contactless inspection of objects with feedback to high speed manufacturing devicecu4,694,158, Cl. 250-223.00B.

Leung, Howard K. H.; Nguyen, Bich-Yen; Alvis, John R.; and Schmiesing, John, to Motorola, Inc. Trench formation processcu4,693,781, Cl. 156-643.000.

Leveille, Serge; Cormier, Jacqueline; Cormier, Ginette; and Brassard, Pierre. Abduction-preventing collarcu4,694,284, Cl. 340-574.000.

Le Viet, Toai, to Nestec S. A. Process and device for homogeneous microwave thermal treatment of liquid or solution in motioncu4,694,133, Cl. 219-10.55M.

Leviton Manufacturing Company, Inc.: *See*—
Campolo, Steve, 4,694,223, Cl. 315-118.000.

Lew, Hyok S.; and Stranahan, Michael. Symbiotic filter-sterilizercu4,694,179, Cl. 250-431.000.

Lewecke, Ernst; and Riesenberg, Manfred, to Lewecke Maschinenbau GmbH. Clamping arrangement for lumber elementscu4,693,458, Cl. 269-21.000.

Lewecke Maschinenbau GmbH: *See*—
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Lewin, David F., to Owens-Corning Fiberglas Corporation. Size compositioncu4,694,034, Cl. 523-503.000.

Lewis, Herbert I.: *See*—
Bilimoria, Bomi M.; Lewis, Herbert I.; Cook, Jerry A.; Turner, Ralph E.; and Garner, Robert H., 4,693,427, Cl. 241-23.000.

Lewis, John C., Jr., to Tucel Industries Inc. Filament stock boxcu4,693,519, Cl. 300-7.000.

Lewis, Marvin C. Segmented boatcu4,693,203, Cl. 114-353.000.

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Lieberman, Barry R.: *See*—
Galli, Guido; Grillo, Alexander A.; and Lieberman, Barry R., 4,694,424, Cl. 365-12.000.

Liegl, Werner: *See*—
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Li-Lee, Chung: *See*—
James, Brian R.; Li-Lee, Chung; Lilga, Michael A.; and Nelson, David A., 4,693,875, Cl. 423-243.000.

Lilga, Michael A.: *See*—
James, Brian R.; Li-Lee, Chung; Lilga, Michael A.; and Nelson, David A., 4,693,875, Cl. 423-243.000.

Lillington, David R.; Mardesich, Nick; Dill, Hans G.; and Garlick, George F. J., to Spectrolab, Inc. Solar cell having improved front surface metallizationcu4,694,115, Cl. 136-256.000.

Lindmayer, Joseph, to Quantex Corporation. Dielectric for electroluminescent devices, and methods for makingcu4,693,906, Cl. 427-69.000.

Lindsay Manufacturing Co.: *See*—
Meis, Charles H.; and Overvaag, Duane B., 4,693,425, Cl. 239-735.000.

Lingren, Clinton L.: *See*—
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Lion Corporation: *See*—
Miyahara, Tsuneo; Harada, Yoshihiro; Futakami, Katsuyuki; Nishida, Yasukuni; and Konishi, Ryoko, 4,693,888, Cl. 424-49.000.

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Liquid Carbonic Corporation: *See*—
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Lisa, Alphonse, to Pomagalski. Funicular railway car having compartment suspended above chassiscu4,693,186, Cl. 105-329.100.

Litef GmbH: *See*—
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Litton Systems, Inc.: *See*—
Bonenberger, Kenneth E., 4,693,527, Cl. 439-13.000.
DiMeo, Frank N., 4,693,505, Cl. 294-119.100.

Liu, Yiu C. Microwave oven turntable with removable table topcu4,694,132, Cl. 219-10.55F.

Liutkis, John J.: *See*—
Babich, Edward D.; Hatzakis, Michael; Liutkis, John J.; Paraszczak, Juri R.; and Shaw, Jane M., 4,693,960, Cl. 430-323.000.

Lloyd, Donald W., to Donald W. Lloyd Realty, Inc. Powder metallurgy process for producing steel articlescu4,693,864, Cl. 419-23.000.

Lobley, David M., to Wargo, Andrew J. Glassworking scroll chuck with interchangeable jawscu4,693,148, Cl. 82-40.00R.

Locatelli, Lorenzo, to Mesdan S.p.A. Mixing head for equipment for joining textile threads with the aid of compressed aircu4,693,067, Cl. 57-22.000.

LoCicero, Joseph L.; Pazarci, Melih; and Rzeszewski, Theodore S., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Recombination of low- and high-resolution segments of an extended aspect ratio picturecu4,694,328, Cl. 358-21.00V.

Lock, Brian E.; and Wojnar, Jeffrey S., to RCA Corporation. Fluid filling apparatuscu4,693,286, Cl. 141-61.000.

Lockwood Technical, Inc.: *See*—
Watts, John D., 4,693,179, Cl. 101-119.000.

Loctite Corporation: *See*—
Salisbury, Richard; and Wyman, Stephen W., 4,694,180, Cl. 250-455.100.

Lodge, Edith M., to Gates Rubber Company, The. Floating hanger merchandise rack and methodcu4,693,381, Cl. 211-94.000.

Loev, Bernard; Chan, Wan-kit; and Jones, Howard, to USV Pharmaceutical Corporation. Alpha-alkyl polyolefinic carboxylic acids and derivatives thereof useful in the treatment of psoriasis and allergic responsescu4,694,023, Cl. 514-559.000.

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Logsdon, Terance B., Jr.; and Fisher, Donald L., to American Standard Inc. Refrigeration tubing jointcu4,693,501, Cl. 285-173.000.

Lohnherr, Ludger, to Krupp Polysius Ag. Siftercu4,693,811, Cl. 209-139.200.

Long, Dabbs C., to MacGregor Golf Company. Golf putter headcu4,693,478, Cl. 273-164.000.

Long, Marianna M.: *See*—
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Loodberg, Jan A. T.; and Siwersson, Olle L., to AB Scaniainventor. Collapsible wheel-chaircu4,693,490, Cl. 280-650.000.

Looser, Gottlieb. Cutting devicecu4,693,157, Cl. 83-431.000.

Loram Maintenance of Way, Inc.: *See*—
Vieau, Robert G.; and Klempke, William D., 4,693,039, Cl. 51-168.000.

Lorenzo, Joseph P.; and Soref, Richard A., to United States of America, Air Force. Guided-wave optical power dividercu4,693,546, Cl. 350-96.130.

Lorenzo, Joseph P.: *See*—
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Losel, Walter; Roos, Otto; and Schnorrenberger, Gerd, to Boehringer Ingelheim KG. 5,6-dihydro-pyrrolo[2,1-a]isoquinolines and the preparation thereofcu4,694,085, Cl. 546-65.000.

Losel, Walter, to U.S. Philips Corporation. Synchronizer for commonly clocked converterscu4,694,388, Cl. 363-72.000.

Lu, Jing-Jong; and Wehrmeister, Herbert L., to International Minerals & Chemical Corp. Phthalamide derivatives with anthelmintic activitycu4,694,016, Cl. 514-380.000.

Lucas Industries Public Limited Company: *See*—
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Reynolds, Desmond H. J.; and Taft, Phillip A., 4,693,273, Cl. 137-596.130.

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Ludwig Schwerdtel GmbH: *See*—
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Luft, Werner: *See*—
Bauer, Kurt H.; Pritzwald-Stegmann, Bernd; and Luft, Werner, 4,693,750, Cl. 106-163.100.

Luhr, Hartmut: *See*—
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Luke, Robert R.; and Barker, James M., to Halliburton Company. Tubing conveyed perforating safety anchorcu4,693,308, Cl. 166-55.100.

Lundback, Stig, to Astra-Tech Aktiebolag. Double pump adapted for use as an artificial heartcu4,693,714, Cl. 623-3.000.

Lupoli, Peter J.; and Mattis, Donald J., to Casco Products Corporation. Float switch construction for monitoring liquid levelscu4,694,128, Cl. 200-84.00R.

Lutze, Theodor: *See*—
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Luwa AG: *See*—
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Lynch, John E.: *See*—
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Lyons, David J., to Princeton Electronics Products, Inc. Video line rate convertercu4,694,337, Cl. 358-140.000.

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M.A.N.Maschinenfabrik Augsburg-Nurnberg AG: *See*—
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M. A. N. Roland Druckmaschinen Aktiengesellschaft: *See*—
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M. W. Kellogg Company, The: *See*—
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Mabeg Maschinenbau GmbH & Company: *See*—
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MacCormack, Robert S.: *See*—
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MacDougall, Frederick W.; and Murphy, Thomas A., to Aerovox Incorporated. Segmented capacitorcu4,694,377, Cl. 361-275.000.

Macfarlane, Andrew R.: *See*—
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MacFarlane, Jerauld C.: *See*—
Mickelson, Nils P.; and MacFarlane, Jerauld C., 4,694,488, Cl. 379-327.000.

MacGregor Golf Company: *See*—
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Mackay, John W.: *See*—
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Mackey, Charles S.: *See*—
Dickinson, Robert W.; Mackey, Charles S.; and Odgers, Irving L., 4,693,327, Cl. 175-61.000.

Mackool, Richard J. Multipartite intraocular lenscu4,693,716, Cl. 623-6.000.

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Lamb, Owen L.; and Maclay, William R., 4,693,373, Cl. 209-3.300.

Macmoter S.p.A: *See*—
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Maeda, Akio; Chida, Takeshi; and Seya, Hirokatsu, to Nippon Zeon Co., Ltd. Rubber composition for dust cover bootscu4,694,067, Cl. 528-393.000.

Maeda, Koji: *See*—
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Maeda, Kozo: *See*—
Kuze, Katsuaki; Nishino, Yasuhiro; Matsuyama, Yujiro; Maeda, Kozo; Kobayashi, Masahiro; Okudaira, Tadashi; Hongo, Tsuyoshi; and Makimura, Osamu, 4,693,932, Cl. 428-323.000.

Maeda, Satoru: *See*—
Shibui, Michiro; Hanamoto, Yoshihiro; Ishigaki, Yoshio; Sahara, Hiroshi; Maeda, Satoru; and Noguchi, Yasushi, 4,694,406, Cl. 364-518.000.

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Magata, Yutaka: *See*—
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Galli, Guido; Grillo, Alexander A.; and Lieberman, Barry R., 4,694,424, Cl. 365-12.000.

Magneville, Pierre, to Institut Francais Du Petrole. Vertical marine streamercu4,694,435, Cl. 367-17.000.

Magoon, Inder K.; and Mayer, Robert E., to General Electric Company. Liquid propellant guncu4,693,165, Cl. 89-7.000.

Mair, Alexander C.; Allgaier, Leonhard; and DeHart, Arnold O., to General Motors Corporation. Line boring apparatuscu4,693,642, Cl. 408-59.000.

Maisch, Wolfgang, to Robert Bosch GmbH. Electric potentiometercu4,694,272, Cl. 338-138.000.

Maisch, Wolfgang: *See*—
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Malagari, Frank A., Jr., to Allegheny Ludlum Corporation. Processing for cube-on-edge oriented silicon steelcu4,693,762, Cl. 148-111.000.

Maleyko, John R. K.; and Grijak, Gerald. Extendible bootcu4,693,018, Cl. 36-1.500.

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Velie, Wally W., 4,693,008, Cl. 30-390.000.

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Malloy, John C.; and Landin, Pedro. Display elementcu4,693,025, Cl. 40-326.000.

Malpass, Jack W., to Berlex Laboratories, Inc. Medication dispenser and containercu4,693,371, Cl. 206-538.000.

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Mansour, James D.; Schulte, Thomas H.; and Neece, Vernon R., to Becton, Dickinson and Company. Composition and method for rapid detection of microorganisms in clinical samplescu4,693,972, Cl. 435-34.000.

Mantovani, Marisa: *See*—
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Marchio', Fabio; and Menniti, Pietro, to SGS Microelettronica S.p.A. Electronic voltage regulating device with compensation for thermal dissipation, particularly for alternatorscu4,694,239, Cl. 323-285.000.

Mardesich, Nick: *See*—
Lillington, David R.; Mardesich, Nick; Dill, Hans G.; and Garlick, George F. J., 4,694,115, Cl. 136-256.000.

Margulis, Walter; Sibbett, Wilson; and Sleat, William E., to National Research Development Corporation. Apparatus for measuring light beam characteristicscu4,693,399, Cl. 356-121.000.

Marinus, Antonius A., to U.S. Philips Corporation. Switched-mode power supply with delay network to reduce switching lossescu4,694,385, Cl. 363-19.000.

Marion, Paul R.; Nemcoes, James J.; and Kolodziej, George C., to National Can Corporation. Apparatus for inspecting containerscu4,693,376, Cl. 209-552.000.

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Stepanek, Premek; Wagner, Ludwig; and Knabel, Walter, 4,693,489, Cl. 280-634.000.

Markham, Charles W. Needle aspiration biopsy device with enclosed fluid supplycu4,693,257, Cl. 128-752.000.

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Goldbach, Manfred; Marquardt, Siegfrid; and Myohl, Jochim, 4,693,262, Cl. 131-84.300.

Marth, Peter, to Mauser-Werke GmbH. Automatic latch for mold closingcu4,693,679, Cl. 425-589.000.

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Blackford, William L.; and Zakharin, Greg, 4,693,732, Cl. 55-112.000.

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Degen, Peter J.; Martin, Jerold; Schriefer, Judy; and Shirley, Brenda, 4,693,985, Cl. 436-531.000.

Martin, Joseph R., to Jomar International, Ltd. Sink strainer having a magnetcu4,692,948, Cl. 4-286.000.

Martin, Merrill D. Unwind stand for web rollscu4,693,433, Cl. 242-58.600.

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Marx, Sherwood D. Multi-tool dowel hole drilling machinecu4,693,647, Cl. 409-163.000.

Maryanoff, Cynthia A.; Plampin, James N.; and Stanzione, Robin C., to McNeilab, Inc. Methane sulfonic acid derivativescu4,693,850, Cl. 260-506.000.

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Stehle, Wolfgang, 4,693,379, Cl. 209-674.000.

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Proksa, Ferdinand; Sulzbach, Hans-Michael; Rohrig, Lothar; and Fuhrbach, Hans-Wilhelm, 4,693,448, Cl. 249-162.000.

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Katsuda, Yoshio; Yoshinaga, Sadao; and Mashine, Hiroyoshi, 4,693,868, Cl. 422-124.000.

Mason, Kent L., to NCR Corporation. Asynchronous FIFO status circuitcu4,694,426, Cl. 365-78.000.

Masoneilan International, Inc.: *See*—
Paetzel, Herbert K., 4,693,450, Cl. 251-121.000.

Masse, Joel: *See*—
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Masse, Serge, to Ross Pulp and Paper Inc. Threading belt for pulp floater dryerscu4,693,405, Cl. 226-91.000.

Massengill, Arnold R. Combination air fairing and auxiliary air braking devicecu4,693,506, Cl. 296-1.00S.

Massey, Edwin M., to ELXSI. Backplane power connector systemcu4,694,123, Cl. 174-117.0FF.

Masuda, Ikuro: *See*—
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Masur, Henry: *See*—
Allegra, Carmen; Drake, James C.; Chabner, Bruce A.; Masur, Henry; and Kovacs, Joseph A., 4,694,007, Cl. 514-260.000.

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Buzzi, Riccardo, 4,693,194, Cl. 112-199.000.

Matas Gabalda, Carlos, to I.C. ACBF. Thread slackening devicecu4,693,068, Cl. 57-58.860.

Matchett, Robert W., to Fibredyne, Inc. Liquid filtercu4,693,823, Cl. 210-266.000.

Mathieu, Andre, to Dorfin Paper Products (Quebec) Limited. Shipping box for clothing with article positioning meanscu4,693,367, Cl. 206-289.000.

Matiere, Marcel. Method of producing hollow structures and hollow structurescu4,693,635, Cl. 405-132.000.

Matney, Earl G., to Tektronix, Inc. Measurement of SC/H phase using a polar displaycu4,694,324, Cl. 358-10.000.

Matsubayashi, Nobuaki: *See*—
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Matsuda, Hiroshi; Haruta, Masahiro; Hirai, Yutaka; Nishimura, Yukuo; Eguchi, Ken; and Nakagiri, Takashi, to Canon Kabushiki Kaisha. Film forming method, recording medium formed thereby and recording method therewithcu4,693,915, Cl. 427-256.000.

Matsuda, Hiroto: *See*—
Ikeda, Masami; Matsuda, Hiroto; Takahashi, Hiroto; and Shohji, Tatsumi, 4,694,306, Cl. 346-140.00R.

Matsuda, Shinichi; and Oosaka, Shigenori, to Fuji Photo Film Co., Ltd. Integral door and magnetic sheet pack holder for use in a magnetic recording/reproducing apparatuscu4,694,364, Cl. 360-99.000.

Matsuda, Shinichi: *See*—
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Matsui, Sadayoshi: *See*—
Yano, Seiki; Yamamoto, Saburo; Matsui, Sadayoshi; and Taneya, Mototaka, 4,694,461, Cl. 372-50.000.

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Akatsu, Yousuke; Yamaguchi, Hirotsugu; Fukushima, Naoto; Hano, Sunao; Sugino, Masaru; Takehara, Shin; and Matsui, Shinichi, 4,693,491, Cl. 280-688.000.

Matsumoto, Seiji: *See*—
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Matsumura, Hiroyoshi; and Ishida, Koji, to Hitachi, Ltd. Optical integrated circuitcu4,693,543, Cl. 350-96.110.

Matsumura, Tsuneo; Mano, Tsuneo; Yamada, Junzo; and Inoue, Junichi, to Nippon Telegraph and Telephone Corporation. Semiconductor memorycu4,694,428, Cl. 365-189.000.

Matsumura, Yasuo: *See*—
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Matsuo, Hiroyoshi, to Shiba Seisakusho Limited Responsibility Company. Insulator for electric terminal attached to electric wirecu4,693,538, Cl. 439-460.000.

Matsuoka, Michihiro: *See*—
Kunikawa, Norihide; Kondo, Tetsuya; Ohba, Yasumasa; and Matsuoka, Michihiro, 4,693,595, Cl. 355-77.000.

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Matsushima, Masaaki: *See*—
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Matsushita Electric Industrial Co., Ltd.: *See*—
Hatada, Kenzo, 4,693,770, Cl. 156-151.000.
Kikuchi, Kazuya; Komeda, Tadao; and Fujita, Tsutomu, 4,693,782, Cl. 156-653.000.

Tomii, Kaoru; and Hamada, Kiyoshi, 4,694,225, Cl. 315-366.000.
Tsuchiya, Tatsuo; and Horumi, Kazuhiro, 4,693,454, Cl. 267-226.000.
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Mishina, Kazuhiro, 4,694,157, Cl. 250-214.00C.
Matsuura, Hiroyuki: *See*—
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Matsuura, Yasuhiko, to Hitachi, Ltd. Dynamic memory diagnosis and error correction apparatuscu4,694,454, Cl. 371-13.000.
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Mattei, Riccardo; Gorrieri, Giordano; and Filippini, Gualtiero, to G.D Societa' per Azioni. Machine for boxing items in groupscu4,693,051, Cl. 53-148.000.
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Mattis, Donald J.: *See*—
Lupoli, Peter J.; and Mattis, Donald J., 4,694,128, Cl. 200-84.00R.
Mattison, Robert N. Illuminated fishing lurecu4,693,032, Cl. 43-17.600.
Mattson, Kenneth V.: *See*—
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Marth, Peter, 4,693,679, Cl. 425-589.000.
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Davies, Graham A.; and Mavituna, Ferda, 4,693,983, Cl. 435-284.000.
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Abe, Yoshio; Okano, Tetsuo; Omori, Tomohiro; and Kawamoto, Minoru, 4,693,225, Cl. 123-568.000.
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Maze, Robert E. Method for converting a sprag-type torque converter into a sprageless torque converter in a power plant having a coaxial impeller and turbine unitcu4,692,977, Cl. 29-156.80R.
Mazurek, Mieczyslaw H., to Minnesota Mining and Manufacturing Company. Polysiloxane-grafted copolymer pressure sensitive adhesive composition and sheet materials coated therewithcu4,693,935, Cl. 428-352.000.
Mazzarolo, Sante, to Alpine Stars S.p.A. Ventilated item of sport footwear, particularly for motorcyclistscu4,693,021, Cl. 36-131.000.
McCaughan, James S., Jr., to Laser Therapeutics, Inc. Apparatus for producing a spherical pattern of light and method of manufacturecu4,693,556, Cl. 350-320.000.
McCole, Thomas P., to Polaroid Corporation. Self-developing integral film unitcu4,693,963, Cl. 430-499.000.
McCool, George W., to Sherwood Medical Company. Tube and fitting assembly and method of making samecu4,693,710, Cl. 604-283.000.
McCutchan, Thomas F.; and Wistar, Richard, Jr., to United States of America, Health and Human Services. Protective synthetic peptide against malaria and encoding genecu4,693,994, Cl. 514-15.000.
McDermott, Julian A.; Verde, Jewel; and McDermott, Wayne. Visual alarm apparatuscu4,694,281, Cl. 340-521.000.
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McDonough, Kevin C.: *See*—
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McEachern, Alexander; and Nitz, Frederic, to Basic Measuring Instruments. Waveform disturbance detection apparatus and methodcu4,694,402, Cl. 364-487.000.
McEwan, Keith J. B., to Lucas Industries Public Limited Company. Electric storage batterycu4,693,948, Cl. 429-121.000.
McFarland, William W.; Gandy, Russell E.; and Churvis, Michael A., to International Paper Company. Laminated bulk bin corner structurecu4,693,413, Cl. 229-48.00R.
McGregor, Charles W.; and Sutto, Melody L., to Essex Group, Inc. Low coefficient of friction magnet wire enamelscu4,693,936, Cl. 428-383.000.
McGrew, Sherman W.: *See*—
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McGroarty, Patrick J.: *See*—
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McGwire, Robert P. Golf club swing training devicecu4,693,479, Cl. 273-186.00A.
McHugh, Stanley A.: *See*—
Meith, Hugo C.; and McHugh, Stanley A., 4,693,233, Cl. 126-117.000.
McKay, Michael L., to Orbital Engine Company Proprietary Limited. Fuel injection method and apparatuscu4,693,224, Cl. 123-531.000.
McKay, Robert J., to Pacific Marina Developments Pty. Ltd. Floating breakwatercu4,693,631, Cl. 405-26.000.
McKee, Graham E.; Ohlig, Hilmar; Reimann, Horst; and Sterzel, Hans-Josef, to BASF Aktiengesellschaft. Elastomeric thermoplastic molding materials and their preparationcu4,694,042, Cl. 525-66.000.
McKernan, Thomas J.; and Wilcockson, Brian, to Haworth, Inc. Method of forming housing for free-standing cabinetcu4,692,984, Cl. 29-445.000.
McKinley, Mark J.: *See*—
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Thornton, David C.; and McKinley, Mark J., 4,693,830, Cl. 210-734.000.
McLean, George S.; Grimes, Paul J.; and van Gucht, Albert, to Acec Power Systems Limited. Method of operating a combined cycle electric power plantcu4,693,072, Cl. 60-39.020.
McLoughlin, Bernard J.: *See*—
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McMakin, Bruce L., to U.S. Chemical & Plastics, Inc. Buffing pad assemblycu4,692,958, Cl. 15-230.120.
McNeil, Gary L., to Roto-Finish Company, Inc. Multistage finishing device and methodcu4,693,037, Cl. 51-163.200.
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Maryanoff, Cynthia A.; Plampin, James N.; and Stanzione, Robin C., 4,693,850, Cl. 260-506.000.
McNennamy, John A.; Nafziger, Steven; Charbonneau, Arthur G.; and Godfrey, Dwaine A., to Charbonneau and Godfrey Associates. Motor operated valve analysis and testing systemcu4,693,113, Cl. 73-168.000.
McPherson, Larry D.: *See*—
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McRoberts, Louis A.; and Felix, Arthur, Jr., to Motorola, Inc. Apparatus for providing constant azimuth cells in an airborne radarcu4,694,300, Cl. 342-195.000.
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Meadows, Michael R.: *See*—
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Meagher, Donald J. R., to Key Bank N.A. High-speed image generation of complex solid objects using octree encodingcu4,694,404, Cl. 364-518.000.
Mecanotron Corporation: *See*—
Alvite', Joseph G., 4,694,231, Cl. 318-568.000.
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Meili, Ernst; and Rimmele, Karl, 4,694,247, Cl. 324-216.000.
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Dorman, Richard A.; and Johnson, Robert E., 4,694,474, Cl. 377-6.000.
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Meece, Donald R.: *See*—
Japikse, Cornelis H.; Van Brocklin, Lester P.; Hembree, Johnny A.; Kitts, Ralph R.; and Meece, Donald R., 4,693,905, Cl. 426-599.000.
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Bauer, Kurt H.; Pritzwald-Stegmann, Bernd; and Luft, Werner, 4,693,750, Cl. 106-163.100.
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Mehrgardt, Soenke, to Deutsche ITT Industries GmbH. Frequency divider circuitcu4,694,475, Cl. 377-48.000.
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Meier, Helmut-Martin; Dhein, Rolf; Winkel, Jens; Klein, Gerhard; and Kloker, Werner, to Bayer Aktiengesellschaft. Polymerizable compositions and the use of arylamines as hardening accelerators for these compositionscu4,694,041, Cl. 525-25.000.
Meiji Seika Kaisha, Ltd.: *See*—
Nakatomi, Yasuo; Hara, Katsuhiko; Umeda, Fumio; Kono, Toshiaki; and Niimoto, Hisashi, 4,693,898, Cl. 426-19.000.
Meili, Ernst; and Rimmele, Karl, to MECAPEC S.A. Method and apparatus including a cushion of pulverulent magnetic material for stray field magnetic testing of ferromagnetic partscu4,694,247, Cl. 324-216.000.
Meininger, Fritz; Mischke, Peter; Konig, Gerd; and Springer, Hartmut, to Hoechst Aktiengesellschaft. Process for dyeing or printing cellulose fibers or cellulose blend fibers with pyridinium-triazine reactive dye, axable without alkalicu4,693,726, Cl. 8-547.000.
Meis, Charles H.; and Overvaag, Duane B., to Lindsay Manufacturing Co. Drive for movable irrigation system and the likecu4,693,425, Cl. 239-735.000.

Meith, Hugo C.; and McHugh, Stanley A., to Energy Technology, Inc. Air preheater systemcu4,693,233, Cl. 126-117.000.
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Meno, Frank, to University of Pittsburgh. Vector electronic control devicecu4,694,279, Cl. 340-347.00P.
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Mercer, Sarah F. Brake line coupler lockcu4,693,096, Cl. 70-14.000.
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Locatelli, Lorenzo, 4,693,067, Cl. 57-22.000.
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Amy, A. Andre ; and Babineaux, Jules, 4,693,102, Cl. 72-53.000.
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Brown, Vincent B.; and McGrew, Sherman W., 4,693,550, Cl. 350-96.200.
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Pehker, Manfred; Pahlke, Edelgard; and Metz, Josef, 4,693,166, Cl. 89-34.000.
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Andra, Rainer, 4,693,455, Cl. 267-140.100.
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Michaelis, Theodore D., to RCA Corporation. Compensation circuit for control system providing pulse width modulated drive signalcu4,694,228, Cl. 318-341.000.
Michelson, Paul E. Intraocular lens formed in situ within the eyecu4,693,717, Cl. 623-6.000.
Mickelson, Nils P.; and MacFarlane, Jerauld C., to GTE Products Corporation. Distributing frame for telecommunications circuitscu4,694,488, Cl. 379-327.000.
Mickiewicz, Stanley P.; and Coombes, Alan, to Codman & Shurtleff, Inc. Transcutaneous nerve stimulation device using a common controller for pulse production and parameter displaycu4,693,254, Cl. 128-421.000.
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Milan, John M., to ITT Gilfillan. Adaptive, fault-tolerant narrowband filterbankcu4,694,298, Cl. 342-89.000.
Miles Laboratories, Inc.: *See*—
Collins, Michael S.; Tsay, Grace C.; and Seng, Richard L., 4,693,891, Cl. 424-92.000.
Millay, Lawrence I., to Ex-Cell-O Corporation. Hollow tool exchanging mechanism for a machine toolcu4,692,990, Cl. 29-568.000.
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Nagel, Gregory L.; Sidlosky, David M.; Murty, Balarama V.; Lee, Anthony; and Cleveland, Dixon, to General Motors Corporation. Method and apparatus for monitoring and controlling resistance spot weldingcu4,694,135, Cl. 219-110.000.
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Nagoya Institute of Technology: *See*—
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Nakagiri, Takashi: *See*—
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Nakagomi, Tamihito: *See*—
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Nakaguti, Osamu; Shimazaki, Norihiko; Kawai, Yoshio; Hashimoto, Masashi; and Nakatuka, Michie, to Fujisawa Pharmaceutical Co., Ltd. Semicarbazide derivatives, processes for preparation thereof and pharmaceutical composition comprising the samecu4,694,004, Cl. 514-228.000.

Nakahara, Masanobu: *See*—
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Nakajima, Sadahiro; and Toratani, Hisayoshi, to Hoya Corporation. Process for producing porous antireflective coatingscu4,693,910, Cl. 427-168.000.

Nakajima, Tadakatsu: *See*—
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Nakajima, Yuji; and Yamamoto, Akito, to Nissan Motor Company, Limited. Engine control systemcu4,693,221, Cl. 123-425.000.

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Nakane, Hisashi: *See*—
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Nakanishi, Susumu; and Nagakura, Isao, to Pfizer Inc. 2H-1,2-benzothiazine derivativescu4,694,080, Cl. 544-49.000.

Nakano, Hiroshi: *See*—
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Nakatomi, Yasuo; Hara, Katsuhiko; Umeda, Fumio; Kono, Toshiaki; and Niimoto, Hisashi, to Oriental Yeast Co., Ltd.; and Meiji Seika Kaisha, Ltd. Novel baker's yeast and process for making breadcu4,693,898, Cl. 426-19.000.

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Nanjo, Toshio; and Tomizawa, Fumio, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Apparatus for automatically charging scrap into an arc furnacecu4,694,465, Cl. 373-81.000.

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Margulis, Walter; Sibbett, Wilson; and Sleat, William E., 4,693,599, Cl. 356-121.000.

National Semiconductor Corporation: *See*—
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Navarro, Vicente N. Component elements for building furniturecu4,693,524, Cl. 312-140.000.

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Young, Rocky M.; and Vo, Tri T., 4,694,395, Cl. 364-200.000.

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Nee, Victor W. Ceiling fancu4,693,673, Cl. 416-199.000.

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Nemcoes, James J.: *See*—
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Neubauer, Walter, to Linsinger Machinenbau Gesellschaft mbH. Process and apparatus for profiling rod-like workpiecescu4,692,989, Cl. 29-558.000.

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Neumann, Gerhard; and Ramisch, Hans, to Otto Dunkel GmbH Fabrik fur Elektrotechnische Gerate. Method of manufacturing contact spring procedurecu4,693,002, Cl. 29-882.000.

New England Institute of Comparative Medicine: *See*—
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NGK Spark Plug Co., Ltd.: *See*—
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Niksa, Marilyn J.; Pohto, Gerald R.; Lakatos, Leslie K.; Wheeler, Douglas J.; Solomon, Frank; Niksa, Andrew J.; Schue, Thomas J.; Genodman, Yury; Turk, Thomas R.; and Hagel, Daniel P., to EL-TECH Systems Corporation. Battery with modular air cathode and anode cagecu4,693,946, Cl. 429-27.000.
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Nippon Chemical Industrial Co., Ltd.: *See*—
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Nishimatsu, Masaharu; Arioka, Hiroyuki; and Ishizaki, Hideki, to TDK Corporation. Magnetic recording medium for image recordingcu4,693,934, Cl. 428-336.000.
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Noguchi, Yasushi: *See*—
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Nok-Megulastik Co., Ltd.: *See*—
Umeyama, Mitsuhiro; Wakahara, Kaoru; Ohtani, Kisao; Kametaka, Kenichi; Kinoshita, Masaru; and Kobayashi, Nobuyuki, 4,693,354, Cl. 192-106.100.
Noll, Wilfried: *See*—
Apfel, Norbert; Stehle, Hans-Peter; and Noll, Wilfried, 4,693,007, Cl. 30-387.000.
Nomura, Hideki: *See*—
Shimizu, Isoo; Hirano, Ryotaro; Matsumura, Yasuo; Nomura, Hideki; Uchida, Kazumichi; and Sato, Atsushi, 4,694,100, Cl. 560-105.000.
Nomura, Minoru, to NEC Corporation. Equalized capacitance wiring method for LSI circuitscu4,694,403, Cl. 364-488.000.
Norand Corporation: *See*—
Hanson, George E., 4,694,237, Cl. 320-6.000.
Norigoe, Masamitsu: *See*—
Kakuda, Yoshiaki; Wakahara, Yasushi; and Norigoe, Masamitsu, 4,694,422, Cl. 364-900.000.
Norisuye, Katuhiro: *See*—
Washio, Katsuyoshi; Hayashi, Makoto; Watanabe, Tomoyuki; Okabe, Takahiro; and Norisuye, Katuhiro, 4,694,321, Cl. 357-48.000.
Norman, Alan B., to R. J. Reynolds Tobacco Company. Cigarette filter having low visible stainingcu4,693,265, Cl. 131-340.000.
North American Agricultural, Inc.: *See*—
Carroll, Michael W.; and Harwood, Michael E., 4,692,980, Cl. 29-243.520.
North American Philips Corporation: *See*—
Tsinberg, Mikhail, 4,694,338, Cl. 358-141.000.
Norton, Peter. Dual voltage power supply system for vehiclescu4,694,238, Cl. 322-28.000.
Nowacki, Christopher: *See*—
Brisson, Alfred G.; and Nowacki, Christopher, 4,693,247, Cl. 128-328.000.
Nowsco Well Service (U.K.) Limited: *See*—
Shulver, Roderick L.; Misselbrook, John; and Standen, Robert, 4,692,988, Cl. 29-458.000.
Nudd, Howard W., Jr.; and De Moura, David N., to Foxboro Company, The. Differential-pressure measuring apparatus with improved overpressure protectioncu4,693,121, Cl. 73-706.000.
Nusser, Hermann: *See*—
Arnold, Herbert; Bosch, Walter; Horbelt, Michael; Maisch, Wolfgang; Nusser, Hermann; Peters, Klaus-Jurgen; Werner, Peter; and Willke, Clemens, 4,693,111, Cl. 73-118.100.
Nyffeler Corti: *See*—
Lamping, Alfons; and Karth, Beat, 4,693,385, Cl. 215-232.000.
O & K Orenstein & Koppel AG: *See*—
Trumper, Reinhard; and Baschant, Robert, 4,693,661, Cl. 414-595.000.
Oberjatzas, Gunter: *See*—
Keesen, Heinz-Werner; Oberjatzas, Gunter; and Peters, Hartmut, 4,694,336, Cl. 358-133.000.
Oberlander, Claude: *See*—
Nedelec, Lucien; Hamon, Gilles; Fauveau, Patrick; and Oberlander, Claude, 4,694,011, Cl. 514-323.000.
Oboler, Leonard: *See*—
Dodds, Diego E. F., 4,693,302, Cl. 165-46.000.
Oce-Nederland B.V.: *See*—
Orbons, Wilhelmus H. M., 4,693,585, Cl. 355-3.0FU.
Ockuly, John D.: *See*—
Caflisch, Jerry A.; and Ockuly, John D., 4,693,014, Cl. 34-23.000.
O'Connell, James P.; Hoke, Randal A.; and Mize, Patrick D., to Becton, Dickinson and Company. Immunoassay using complementcu4,693,970, Cl. 435-7.000.
Oda, Eiji, to NEC Corporation. Buried channel charge coupled devicecu4,694,476, Cl. 377-58.000.
Oda, Hajime: *See*—
Ogihara, Masuo; Oda, Hajime; Seki, Yoichi; and Yamazaki, Hiroshi, 4,693,583, Cl. 354-439.000.
Odgers, Irving L.: *See*—
Dickinson, Robert W.; Mackey, Charles S.; and Odgers, Irving L., 4,693,327, Cl. 175-61.000.
O'Donnell, John B., to Rorer Pharmaceutical Corporation. Mandrel for opening a tube of flexible materialcu4,693,059, Cl. 53-567.000.
O'Donnell, Philip P.: *See*—
Gale, Stephen B.; and O'Donnell, Philip P., 4,693,798, Cl. 204-149.000.
Oehler, Henry; Peth, Norbert; Holpp, Hans W.; and Sass, Wolfgang, to Gebr. Steimel. Centrifuging installationcu4,693,017, Cl. 34-58.000.
Oehsen, Ubbo v.; Stecher, Karlheinz; Koehler, Waldemar; Mueller, Berthold; Brunnmueller, Fritz; and Schneider, Rolf, to BASF Aktiengesellschaft. Cleavage of formamide to give hydrocyanic acid and watercu4,693,877, Cl. 423-373.000.
Oellers, Dieter, to W. Schlafhorst & Co. Compressed air thread splicing devicecu4,693,066, Cl. 57-22.000.
Oetiker, Hans. Pipe connectioncu4,693,502, Cl. 285-334.500.
Oettgen, Herbert F.: *See*—
Houghton, Alan N.; Brooks, Hannah; Cote, Richard J.; Oettgen, Herbert F.; and Old, Lloyd J., 4,693,966, Cl. 435-7.000.
Office Automation Systems, Inc.: *See*—
Bradbury, Colin; and Douglas, George H., 4,694,405, Cl. 364-518.000.
Office National d'Etudes et de Recherches Aerospatiales: *See*—
Slodzian, Georges; Daigne, Bernard; and Girard, Francois, 4,694,170, Cl. 250-309.000.
Offner, Abe, to Perkin-Elmer Corporation, The. Method and apparatus for optical system adjustmentscu4,693,569, Cl. 350-505.000.
Ofstead, Ronald F., to Minnesota Mining and Manufacturing Company. Article coated with copolymer of poly(vinyl alcohol)cu4,693,939, Cl. 428-421.000.
Ofstead, Ronald F., to Minnesota Mining and Manufacturing Company. Copolymers of poly(vinyl trifluoroacetate) or poly(vinyl alcohol)-cu4,694,037, Cl. 524-557.000.
Ogami, Nobutoshi; and Kitagawa, Masaru, to Dainippon Screen Mfg. Co., Ltd. Surface treatment apparatuscu4,693,211, Cl. 118-725.000.
Ogawa, Takashi. Auxiliary instrument for stretching and softening exercisescu4,693,470, Cl. 272-96.000.
Ogawa, Tetsu, to Canon Denshi Kabushiki Kaishsa. Interface system which selectively provides impedance matching between a host computer and a control circuitcu4,694,421, Cl. 364-900.000.
Ogawa, Tomoya; Sugimoto, Mamoru; Shitori, Yoshiyasu; and Ito, Masayoshi, to Kanto Ishi Pharmaceutical Co., Ltd.; and Rikagaku Kenkyusho. Sialic acid derivativescu4,694,076, Cl. 536-17.200.
Ogden, Joan M., to RCA Corporation. Fractal generation, as for video graphic displayscu4,694,407, Cl. 364-518.000.
Ogihara, Masuo; Oda, Hajime; Seki, Yoichi; and Yamazaki, Hiroshi, to Seikosha Co., Ltd. Programmable shuttercu4,693,583, Cl. 354-439.000.
Ogita, Sachio, to Sumitomo Bakelite Company Limited; and Ogita, Sachio. Cervical canal cathetercu4,693,704, Cl. 604-55.000.
Oguchi, Yoshihiro: *See*—
Takasu, Yoshio; Oguchi, Yoshihiro; and Katagiri, Kazuharu, 4,693,951, Cl. 430-31.000.
Ogura, Koji; and Sobue, Hideo, to NGK Spark Plug Co., Ltd. Underwater acoustic wave transmitting and receiving unitcu4,694,440, Cl. 367-152.000.
Ogusu, Mikio: *See*—
Tamaru, Takuya; and Ogusu, Mikio, 4,694,448, Cl. 369-291.000.
O'Halloran, Rosemary: *See*—
Varma, Vijaya K.; Winans, Esther D.; O'Halloran, Rosemary; and Brewster, Phillip W., 4,693,838, Cl. 252-51.50R.
Ohashi, Kaoru: *See*—
Buma, Shuuichi; Onuma, Toshio; Ohashi, Kaoru; and Itou, Masami, 4,693,494, Cl. 280-707.000.
Ohba, Hitoshi: *See*—
Itoh, Kenichi; Noguki, Genji; Tanaka, Motoaki; and Ohba, Hitoshi, 4,694,053, Cl. 526-74.000.
Ohba, Masahiro: *See*—
Kamei, Eiichi; Namba, Hideaki; and Ohba, Masahiro, 4,693,485, Cl. 280-6.00R.
Ohba, Yasumasa: *See*—
Kunikawa, Norihide; Kondo, Tetsuya; Ohba, Yasumasa; and Matsuoka, Michihiro, 4,693,595, Cl. 355-77.000.
Ohgoda, Makoto; Tamura, Kaoru; and Kawai, Yasuhiro, to Fuji Photo Film Co., Ltd. Apparatus for scanning sheet-shaped recording medium with a bending rollercu4,694,163, Cl. 250-234.000.
Ohkawa, Takashi: *See*—
Miyamura, Tamio; and Ohkawa, Takashi, 4,694,431, Cl. 365-189.000.
Ohlig, Hilmar: *See*—
McKee, Graham E.; Ohlig, Hilmar; Reimann, Horst; and Sterzel, Hans-Josef, 4,694,042, Cl. 525-66.000.
Ohminato, Kiyoshi, to King Jim Co., Ltd. Binder assemblies-cu4,693,625, Cl. 402-27.000.
Ohmizu, Akimasa: *See*—
Uemura, Yahiro; Ohmura, Takao; Ohmizu, Akimasa; Sumi, Akinori; Ohtani, Wataru; Sakanishi, Yoshitaka; Morise, Hiroshi; Arimura, Hirofumi; and Suyama, Tadakazu, 4,694,074, Cl. 530-417.000.
Ohmura, Takao: *See*—
Uemura, Yahiro; Ohmura, Takao; Ohmizu, Akimasa; Sumi, Akinori; Ohtani, Wataru; Sakanishi, Yoshitaka; Morise, Hiroshi; Arimura, Hirofumi; and Suyama, Tadakazu, 4,694,074, Cl. 530-417.000.
Ohnuki, Ichiro; Aihara, Yoshihiko; Tosaka, Yoichi; and Eguchi, Masaharu, to Canon Kabushiki Kaisha. Film information reading devicecu4,693,574, Cl. 354-21.000.
Ohnuma, Masao: *See*—
Nishimura, Takahiro; and Ohnuma, Masao, 4,693,401, Cl. 222-607.000.
Ohshima, Takefumi: *See*—
Noguchi, Takashi; Hayashi, Hisao; and Ohshima, Takefumi, 4,693,759, Cl. 437-24.000.
Ohtani, Kisao: *See*—
Umeyama, Mitsuhiro; Wakahara, Kaoru; Ohtani, Kisao; Kametaka, Kenichi; Kinoshita, Masaru; and Kobayashi, Nobuyuki, 4,693,354, Cl. 192-106.100.

Ohtani, Wataru: *See*—
Uemura, Yahiro; Ohmura, Takao; Ohmizu, Akimasa; Sumi, Akinori; Ohtani, Wataru; Sakanishi, Yoshitaka; Morise, Hiroshi; Arimura, Hirofumi; and Suyama, Tadakazu, 4,694,074, Cl. 530-417.000.

Ohtsuka, Nobuaki: *See*—
Tanaka, Sumio; Saito, Shinji; Atsumi, Shigeru; and Ohtsuka, Nobuaki, 4,694,429, Cl. 365-189.000.

Ohuchi, Masayuki: *See*—
Oodaira, Hirosi; Suzuki, Haruko; Saito, Masayuki; and Ohuchi, Masayuki, 4,694,138, Cl. 219-121.0LM.

Ohura, Akio: *See*—
Morimoto, Hiroshi; and Ohura, Akio, 4,694,086, Cl. 564-236.000.

Ohyama, Masao; Yamamoto, Yoshinori; Horikawa, Kenichi; and Kawakami, Kenji, to Sony Corporation. Tape cassette with concave engagement portion and player with hook engageable therewithcu4,694,360, Cl. 360-96.500.

Ohyauchi, Hideo; Amano, Yoshiaki; and Yokoyama, Eiji, to Hitachi, Ltd. Power generator containing fuel cellcu4,693,945, Cl. 429-21.000.

OI Forest Products STS Inc.: *See*—
Snyder, Teddy R., 4,693,411, Cl. 229-23.00R.

Oi, Ryu: *See*—
Takenaka, Shinji; and Oi, Ryu, 4,694,110, Cl. 568-638.000.

Oils Industry Co., Ltd.: *See*—
Kohama, Masayuki; Wakabayashi, Tatsuro; and Tsunoda, Kouichi, 4,693,107, Cl. 72-354.000.

Oishi, Kengo: *See*—
Ommori, Shozo; and Oishi, Kengo, 4,694,370, Cl. 360-133.000.

Oka, Yosio, to Honda Giken Kogyo Kabushiki Kaisha. Power transmission apparatus for vehiclescu4,693,333, Cl. 180-233.000.

Okabe, Takahiro: *See*—
Washio, Katsuyoshi; Hayashi, Makoto; Watanabe, Tomoyuki; Okabe, Takahiro; and Norisuye, Katuhiro, 4,694,321, Cl. 357-48.000.

Okabe, Yoshiaki: *See*—
Hirai, Yoichi; Fujii, Tsunenori; Koto, Kaoru; Suzuki, Kenji; Yoshida, Masahiro; Okawa, Hisashi; Okabe, Yoshiaki; Kitamura, Teruo; Yokokura, Hisao; Hattori, Shintaroo; Mukoh, Akio; and Sato, Mikio, 4,694,098, Cl. 560-59.000.

Okada, Hiroshi: *See*—
Taki, Masaru; Okada, Hiroshi; Kawamura, Seijiro; Kusumoto, Akio; Morita, Koji; Ikenaga, Takao; Shigematsu, Toshifumi; and Iida, Masami, 4,692,951, Cl. 4-664.000.

Okada, Mikiro: *See*—
Hirano, Takaaki; Kamuro, Setsufumi; Yamaguchi, Akira; Tanimoto, Junichi; and Okada, Mikiro, 4,694,393, Cl. 364-200.000.

Okada, Yoshikatsu, to NEC Corporation. Liquid cooling module with springy contact elements and an aperture plate slidable thereovercu4,693,303, Cl. 165-80.400.

Okami, Yuji: *See*—
Kuwamoto, Hiroshi; Iwadoo, Shuichi; Okami, Yuji; Nagamori, Hiroyuki; and Nakagawa, Yasuhiro, 4,693,839, Cl. 252-51.50A.

Okamoto, Tadashi; Shimoyama, Kazuhiko; Yamaoka, Hiromasa; and Takakura, Mitsuro, to Hitachi, Ltd. Programmable controller with direct to plant addressingcu4,694,419, Cl. 364-900.000.

Okane, Yukihiro: *See*—
Itou, Hiroshi; Okane, Yukihiro; and Kuramoto, Akio, 4,693,222, Cl. 123-432.000.

Okano, Tetsuo: *See*—
Abe, Yoshio; Okano, Tetsuo; Omori, Tomohiro; and Kawamoto, Minoru, 4,693,225, Cl. 123-568.000.

Okawa, Hisashi: *See*—
Hirai, Yoichi; Fujii, Tsunenori; Koto, Kaoru; Suzuki, Kenji; Yoshida, Masahiro; Okawa, Hisashi; Okabe, Yoshiaki; Kitamura, Teruo; Yokokura, Hisao; Hattori, Shintaroo; Mukoh, Akio; and Sato, Mikio, 4,694,098, Cl. 560-59.000.

Oki Electric Industry Co., Ltd.: *See*—
Etoh, Hiroshi, 4,694,473, Cl. 375-116.000.

Okita, Tsutomu: *See*—
Nishikawa, Yasuo; Okita, Tsutomu; Mukaida, Yoshito; Yanagihara, Kenji; Kimura, Mituo; and Niinomi, Masahiro, 4,693,927, Cl. 428-216.000.

Okuda, Eiji: *See*—
Yamasaki, Tetsuya; and Okuda, Eiji, 4,693,544, Cl. 350-96.160.

Okudaira, Tadashi: *See*—
Kuze, Katsuaki; Nishino, Yasuhiro; Matsuyama, Yujiro; Maeda, Kozo; Kobayashi, Masahiro; Okudaira, Tadashi; Hongo, Tsuyoshi; and Makimura, Osamu, 4,693,932, Cl. 428-323.000.

Okuhira, Hidekazu; and Wada, Yasuo, to Hitachi, Ltd. Manufacturing apparatus for semiconductor devicescu4,693,779, Cl. 156-638.000.

Okumoto, Ryouji: *See*—
Ukai, Mikio; and Okumoto, Ryouji, 4,693,484, Cl. 277-212.0FB.

Okumoto, Yutaka, to Japan Tobacco & Salt Public Corporation, The. Continuous cigarette rod cutting apparatus for a cigarette making machinecu4,693,260, Cl. 131-84.100.

Okumoto, Yutaka, to Japan Tobacco & Salt Public Corporation, The. Continuous cigarette rod cutting apparatus for a cigarette making machinecu4,693,261, Cl. 131-84.100.

Olavarria, Raul: *See*—
Goronszy, Mervyn C.; and Olavarria, Raul, 4,693,821, Cl. 210-241.000.

Old, Lloyd J.: *See*—
Houghton, Alan N.; Brooks, Hannah; Cote, Richard J.; Oettgen, Herbert F.; and Old, Lloyd J., 4,693,966, Cl. 435-7.000.

Olsen, Peter C., Jr.; Conforto, Peter M.; Wolf, David L.; and Hudson, Donald R., to Manville Corporation. Method and apparatus for feeding containers to a carrier sleevecu4,693,055, Cl. 53-443.000.

Olson, Dean A., II, to Rockford Acromatic Products Co. Composite roller for the tripod of a free-plunging constant velocity universal jointcu4,693,698, Cl. 464-111.000.

Olsoni, Yrjo : *See*—
Antikainen, Jorma; Olsoni, Yrjo ; and Valimaki, Pentti, 4,693,360, Cl. 198-509.000.

Olsson, Billy E., to AMP Incorporated. Circuit board switch having improved switch springcu4,694,129, Cl. 200-68.200.

Olvera, Armando C. Table saw accessorycu4,693,156, Cl. 83-422.000.

Olympus Optical Co., Ltd.: *See*—
Imaizumi, Masaki, 4,693,566, Cl. 350-427.000.
Takahashi, Susumu, 4,693,568, Cl. 350-469.000.

Olympuis Optical Co., Ltd: *See*—
Miyasaka, Tetsuo, 4,693,584, Cl. 354-446.000.

Omachen, Ludwig; and Janson, Stephen. Release means for sailboard footstrapscu4,693,199, Cl. 114-39.000.

O'Mara, Raymond D.; and Shapiro, Ian M., to Carrier Corporation. Condensate disposal systemcu4,693,091, Cl. 62-272.000.

Ommori, Shozo; and Oishi, Kengo, to Fuji Photo Film Co., Ltd. Magnetic disk cartridgecu4,694,370, Cl. 360-133.000.

Omori, Shigeru. Anti-theft device for vehicle wheels (geared oval nut)cu4,693,655, Cl. 411-429.000.

Omori, Tomohiro: *See*—
Abe, Yoshio; Okano, Tetsuo; Omori, Tomohiro; and Kawamoto, Minoru, 4,693,225, Cl. 123-568.000.

Omron Tateisi Electronics Co.: *See*—
Ueno, Fumio; Yamakawa, Takeshi; and Shirai, Yuji, 4,694,418, Cl. 364-807.000.

O'Neill, Ronan R., to W. R. Grace & Co., Cryovac Div. Taped bag chain with cassettecu4,693,372, Cl. 206-554.000.

Ono, Kenichi: *See*—
Haraguchi, Eiji; Nakagawa, Hiroto; Bando, Akira; Kuwahara, Takao; Nohara, Haruo; and Ono, Kenichi, 4,694,189, Cl. 290-40.00C.

Ono, Yoshihiro: *See*—
Higashi, Akio; Shinada, Haruji; Kawajiri, Kazuhiro; Ono, Yoshihiro; Saitou, Mitsuo; Tamura, Hiroshi; and Ikeda, Mitsuru, 4,694,317, Cl. 357-30.000.

Onoda, Ruri; Kuroki, Yoichi; and Nakamura, Gen, to Canon Kabushiki Kaisha. System for photoelectric detectioncu4,694,186, Cl. 250-578.000.

Onuma, Toshio: *See*—
Buma, Shuuichi; Onuma, Toshio; Ohashi, Kaoru; and Itou, Masami, 4,693,494, Cl. 280-707.000.

Oodaira, Hirosi; Suzuki, Haruko; Saito, Masayuki; and Ohuchi, Masayuki, to Kabushiki Kaisha Toshiba. Method of forming conductor pathcu4,694,138, Cl. 219-121.0LM.

Oonishi, Akiyoshi; Tanaka, Kenji; Tadeka, Makoto; Konno, Kazuhiko; and Saito, Masaki, to Mitsubishi Yuka Fine Chemicals Co., Ltd. Calcium carboxylate phenol derivativecu4,694,102, Cl. 562-426.000.

Oosaka, Shigenori; and Matsuda, Shinichi, to Fuji Photo Film Co., Ltd. Device for loading or unloading magnetic disc packcu4,694,362, Cl. 360-97.000.

Oosaka, Shigenori: *See*—
Matsuda, Shinichi; and Oosaka, Shigenori, 4,694,364, Cl. 360-99.000.

Oowa, Nobutaka: *See*—
Ikemoto, Hiroyuki; Oowa, Nobutaka; Hayashi, Yasutaka; and Doi, Shunichi, 4,693,493, Cl. 280-707.000.

Opalko, Albert: *See*—
Archibald, John L.; Ward, Terence J.; and Opalko, Albert, 4,694,012, Cl. 514-332.000.

Orbital Engine Company Proprietary Limited: *See*—
McKay, Michael L., 4,693,224, Cl. 123-531.000.

Orbons, Wilhelmus H. M., to Oce-Nederland B.V. Contact fixing device with an improved cleaning rollercu4,693,585, Cl. 355-3.0FU.

Oriental Yeast Co., Ltd.: *See*—
Nakatomi, Yasuo; Hara, Katsuhiko; Umeda, Fumio; Kono, Toshiaki; and Niimoto, Hisashi, 4,693,898, Cl. 426-19.000.

Orlosky, Henry, to Techna Vision, Inc. Gasket for molding plastic lensescu4,693,446, Cl. 249-53.00R.

Oronzio deNora Impianti Elettrochimici S.p.A.: *See*—
deNora, Oronzio, 4,693,797, Cl. 204-128.000.

Orr, Clyde, Jr.: *See*—
Killip, Graham R.; Camp, Ronnie W.; and Orr, Clyde, Jr., 4,693,124, Cl. 73-863.110.

Orthomatrix, Inc.: *See*—
Vit, Jaroslay; Salsbury, Ronald L.; and Henderson, Don J., 4,693,986, Cl. 501-1.000.

Orthomedics, Inc.: *See*—
Clover, William M., Jr., 4,693,239, Cl. 128-80.00F.

Oruh, Samuel N.: *See*—
Bowe, Michael J.; Oruh, Samuel N.; and Singh, Jaswant, 4,693,822, Cl. 210-255.000.

Osborn, Coy D.: *See*—
Wilson, Buddy A.; and Osborn, Coy D., 4,693,278, Cl. 138-89.000.

Osborne, John R.: *See*—
Bischoff, Peter G.; Rauch, David J.; Retort, Vincent D.; and Osborne, John R., 4,694,368, Cl. 360-126.000.

Ostapchenko, George J., to Du Pont de Nemours, E. I., and Company. Reinforced poly(ethylene terephthalate) compositionscu4,693,941, Cl. 428-480.000.

Osterlund, Rolf G. L.: *See*—
Bergwitz-Larsen, Carl-Aage; and Osterlund, Rolf G. L., 4,693,997, Cl. 514-54.000.

Osypka, Peter; and Gerstmann, Hans, to Dr. Ing. P. Osypka GmbH Medizinelektronik. Surgical electrode for cardiac pacing and monitoringcu4,693,258, Cl. 128-783.000.

Ota, Masuaki, to Sony Corporation. Printed circuit boardcu4,694,121, Cl. 174-68.500.

Otani, Masatoshi: *See*—
Ina, Kenzoh; Otani, Masatoshi; and Mishima, Kenichi, 4,694,352, Cl. 358-257.000.

Otis Engineering Corporation: *See*—
Dollison, William W., 4,693,171, Cl. 91-216.00B.
Taylor, Frank H., 4,693,315, Cl. 166-336.000.

Otsuka Pharmaceutical Co., Ltd.: *See*—
Uchida, Minoru; Komatsu, Makoto; and Nakagawa, Kazuyuki, 4,694,017. Cl. 514-418.000.

Otsuka, Toru: *See*—
Morita, Kazuyuki; and Otsuka, Toru, 4,694,456, Cl. 371-38.000.

Otto Dunkel GmbH Fabrik fur Elektrotechnische Gerate: *See*—
Neumann, Gerhard; and Ramisch, Hans, 4,693,002, Cl. 29-882.000.

Ouhayoun, Michel M.: *See*—
Midavaine, Thierry, R.; and Ouhayoun, Michel M., 4,694,458, Cl. 372-32.000.

Outdoor Electronics, Ltd.: *See*—
Krutz, Gary W.; and Kruse, James W., 4,693,125, Cl. 73-862.390.

Overvaag, Duane B.: *See*—
Meis, Charles H.; and Overvaag, Duane B., 4,693,425, Cl. 239-735.000.

Ovonic Synthetic Materials Company, Inc.: *See*—
Keem, John E.; Ovshinsky, Stanford R.; Flessa, Steven A.; Wood, James L.; Hart, Keith L.; and Sztaba, Lennard, 4,693,933, Cl. 428-333.000.

Ovshinsky, Stanford R.: *See*—
Keem, John E.; Ovshinsky, Stanford R.; Flessa, Steven A.; Wood, James L.; Hart, Keith L.; and Sztaba, Lennard, 4,693,933, Cl. 428-333.000.

Owens-Corning Fiberglas Corporation: *See*—
Elias, Samir F., 4,693,752, Cl. 106-280.000.
Lewin, David F., 4,694,034, Cl. 523-503.000.

Owens-Illinois, Inc.: *See*—
DiFrank, Frank J., 4,693,210, Cl. 118-259.000.

Owens, Thomas L.; Baity, Frederick W.; Hoffman, Daniel J.; and Whealton, John H., to United States of America, Energy. Radio frequency coaxial feedthrough devicecu4,694,264, Cl. 333-34.000.

Owensby, Max T. Flexible electromagnetic pulse shielding conduitcu4,693,323, Cl. 174-35.00C.

Oxytechnik: *See*—
Bohm, August; Lentz, Gerhard; and Wilkens, Gunter, 4,693,761, Cl. 148-9.00R.

Oy Ekofinn Ab: *See*—
Salokangas, Arto, 4,693,816, Cl. 210-150.000.

Oya, Takeo, to NEC Corporation. Diagnostic disk for checking the head alignment of magnetic disk drivescu4,694,359, Cl. 360-76.000.

Ozaki, Yasuto. Apparatus for projecting luminous lines on an object by a laser beamcu4,693,567, Cl. 350-433.000.

Ozawa, Kunitaka; Ayata, Naoki; Suzuki, Hidetoshi; Saito, Seiji; and Koumura, Noboru, to Canon Kabushiki Kaisha. Color image reading apparatuscu4,694,502, Cl. 382-17.000.

Ozen Corporation: *See*—
Koike, Eishi, 4,694,444, Cl. 369-65.000.
Koike, Eishi, 4,694,445, Cl. 369-65.000.
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Pabst, Manfred; and Mevissen, Peter, to A. Monforts GmbH & Co. Infrared dryercu4,693,013, Cl. 34-4.000.

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Dougher, Christine A.; and Rath, Mary L., 4,692,952, Cl. 5-37.00R.
Rathnam, Premila: *See—*
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Ratzel, Dieter: *See—*
Post, Hans; Ratzel, Dieter; Brunner, Peter; and Knuttel, Bertold, 4,694,249, Cl. 324-309.000.
Rauch, David J.: *See—*
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Rauma-Repola OY: *See—*
Helpio, Pentti K., 4,693,202, Cl. 114-74.00A.
Raychem Corporation: *See—*
Bannick, Mark A.; Divers, George A., III; and Jansons, Viktors, 4,693,851, Cl. 260-544.00D.
Vogdes, Christine E.; and Kawazoye, Yutaka, 4,693,940, Cl. 428-422.000.
Raytheon Company: *See—*
Bond, Bruce E.; and Harrold, William J., 4,693,812, Cl. 209-224.000.
Cantwell, Robert H., 4,694,417, Cl. 364-752.000.
RCA Corporation: *See—*
Aceti, John G., 4,693,370, Cl. 206-488.000.
Arbeiter, James H., 4,694,413, Cl. 364-724.000.
Christopher, Todd J., 4,694,414, Cl. 364-724.000.
Demmer, Walter H., 4,694,326, Cl. 358-19.000.
Demmer, Walter H.; Harwood, Leopold A.; Patel, Chandrakant B.; and Balaban, Alvin R., 4,694,327, Cl. 358-19.000.
Harwood, Robert E.; and Hawrylo, Frank Z., 4,693,649, Cl. 409-293.000.
Hinn, Werner, 4,694,350, Cl. 358-242.000.
Hsu, Sheng T., 4,692,992, Cl. 437-57.000.
Law, Kirk A.; and Harwood, Leopold A., 4,694,331, Cl. 358-31.000.
Lock, Brian E.; and Wojnar, Jeffrey S., 4,693,286, Cl. 141-61.000.
Michaelis, Theodore D., 4,694,228, Cl. 318-341.000.
Morrell, Albert M., 4,694,216, Cl. 313-402.000.
Ogden, Joan M., 4,694,407, Cl. 364-518.000.
Sprague, David L., 4,694,197, Cl. 307-269.000.
Wilber, James A., 4,694,226, Cl. 315-408.000.
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Bischoff, Peter G.; Rauch, David J.; Retort, Vincent D.; and Osborne, John R., 4,694,368, Cl. 360-126.000.
Rebmann, Manfred; Rothermel, Otto; and Stirnkorb, Willi, to Robert Bosch GmbH. Apparatus for aseptic packagingcu4,693,052, Cl. 53-167.000.
Reeb, Max E. Identification device in the form of a tag-like strip affixable to an articlecu4,694,283, Cl. 340-572.000.
Reesor, Gordon J.; Beirne, Patrick R.; and Styrna, Zbigniew B., to Mitel Corporation. Digital tone detectorcu4,694,482, Cl. 379-27.000.
Reimann, Horst: *See—*
McKee, Graham E.; Ohlig, Hilmar; Reimann, Horst; and Sterzel, Hans-Josef, 4,694,042, Cl. 525-66.000.
Reimels, Harry G., to Mentor D & O, Inc. Suture tying forcepscu4,693,246, Cl. 128-321.000.

Reinartz, Hans D., to ITT Industries Incorporated. Vacuum brake force boostercu4,693,083, Cl. 60-547.100.

Reinemuth, George H.: *See*—
Connor, Mark J.; Reinemuth, George H.; and Cleveland, Richard S., 4,693,109, Cl. 72-456.000.

Reinhardt, Wilhelm; and Lipp, Helmut, to eben Elektrobau Mulfingen GmbH & Co. Protection circuit for stalling protection in commutatorless direct current motorscu4,694,371, Cl. 361-23.000.

Renk, Rolf, to General Motors Corporation. Ball joint, especially for motor vehiclescu4,693,628, Cl. 403-135.000.

Research Corporation: *See*—
Gormus, Bobby J., 4,693,967, Cl. 435-7.000.

Research Development Corporation of Japan: *See*—
Higuchi, Toshiro, 4,694,401, Cl. 364-475.000.
Kiniwa, Hideaki, 4,694,044, Cl. 525-178.000.

Research Products Corporation: *See*—
Guetersloh, Timothy L., 4,693,048, Cl. 52-664.000.

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Bacskai, Endre; Retfalvi, Ferenc; and Sasdi, Andras, 4,694,479, Cl. 378-58.000.

Retort, Vincent D.: *See*—
Bischoff, Peter G.; Rauch, David J.; Retort, Vincent D.; and Osborne, John R., 4,694,368, Cl. 360-126.000.

Revetements De Couvin: *See*—
Moreau, Jean-Frederic, 4,693,911, Cl. 427-196.000.

Rexair, Inc.: *See*—
Erickson, Roy O., Jr., 4,693,734, Cl. 55-248.000.

Reynolds, Desmond H. J.; and Taft, Phillip A., to Lucas Industries Public Limited Company. Control valvecu4,693,273, Cl. 137-596.130.

Rezek, Edward A.; and Burghard, Andre, to TRW Inc. Planar light-emitting diodecu4,694,311, Cl. 357-17.000.

Rheinmetall GmbH: *See*—
Pehker, Manfred; Pahlke, Edelgard; and Metz, Josef, 4,693,166, Cl. 89-34.000.
Schwenzer, Michael; Eskam, Armin; Simon, Walter; and Becker, Wilfried, 4,693,434, Cl. 244-328.000.

Rhenter, Jean L.; and Collomb, Jean. Total hip prosthesis with primary fixationcu4,693,724, Cl. 623-23.000.

Rhone-Poulenc Sante: *See*—
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Rhone-Poulenc Specialites Chimiques: *See*—
Porte, Huques; and Lebrun, Jean-Jacques, 4,694,060, Cl. 528-14.000.

Rice, Norman B. Lining removal processcu4,692,982, Cl. 29-402.090.

Richard, Daniel: *See*—
Billard, Georges; Blanchard, Francoise; Klemenz, Willy; Combet, Roger; and Richard, Daniel, 4,693,429, Cl. 242-18.00G.

Richmond, Donald W.; Clyne, Carl W.; and Holben, Tod M., to Anheuser-Busch, Incorporated. Pasteurization processcu4,693,902, Cl. 426-407.000.

Richter, Bernd: *See*—
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Ricoh Company, Ltd.: *See*—
Sato, Tsutomu; Murayama, Noboru; and Sato, Key, 4,694,353, Cl. 358-283.000.
Uchida, Satoru, 4,694,332, Cl. 358-75.000.
Umeda, Shin, 4,693,590, Cl. 355-14.0SH.

Riebli, Peter: *See*—
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Riederer, Stephen J.; Wright, Ronald C.; and Lee, James N., to Duke University. Automated estimation of T1 and T2 relaxation timescu4,694,252, Cl. 324-309.000.

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Rimmele, Karl: *See*—
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Ringgenberg, Paul D.; Newman, Daniel A.; and Beck, Harold K., to Halliburton Company. Round mandrel slip jointcu4,693,316, Cl. 166-355.000.

Ritchie, Douglas, to Design Corp. Logo clockcu4,693,613, Cl. 368-238.000.

Rittinger, Herbert; Gertitschke, Detlev H.; Rapp, Karlheinz; and Eberle, Bernd, to Josef Uhlmann Maschinenfabrik GmbH & Co. KG. Apparatus for ordering and feeding a small item like a tablet, capsule, pill or dragee in a packaging machinecu4,693,057, Cl. 53-539.000.

Rivera, Charles A. Portable chain lockcu4,693,097, Cl. 70-18.000.

Robert Bosch GmbH: *See*—
Arnold, Herbert; Bosch, Walter; Horbelt, Michael; Maisch, Wolfgang; Nusser, Hermann; Peters, Klaus-Jurgen; Werner, Peter; and Willke, Clemens, 4,693,111, Cl. 73-118.100.
Buck, Manfred; Fehrle, Siegfried; Holzel, Martin; Kabatnik, Wilfried; Schmid, Wolfgang; and Wanner, Karl, 4,693,407, Cl. 227-109.000.
Dettling, Hubert; Haag, Gottlob; Hagele, Karl-Heinz; Leonhard, Rolf; and Polach, Wilhelm, 4,693,078, Cl. 60-295.000.
Maisch, Wolfgang, 4,694,272, Cl. 338-138.000.
Rebmann, Manfred; Rothermel, Otto; and Stirnkorb, Willi, 4,693,052, Cl. 53-167.000.

Roberts, Simon. Pneumatic tire leak detectorcu4,693,118, Cl. 73-40.700.

Robinson, David E., to Commonwealth of Australia, The. Real time ultrasonic scanning method and apparatuscu4,693,120, Cl. 73-618.000.

Rockford Acromatic Products Co.: *See*—
Olson, Dean A., II, 4,693,698, Cl. 464-111.000.

Rockwell International Corporation: *See*—
Cross, Richard A., 4,694,263, Cl. 332-20.000.
Guill, Dennis J.; McPherson, Larry D.; and Sizelan, John H., 4,694,267, Cl. 333-248.000.
Lavely, Daniel, 4,693,342, Cl. 188-79.50K.

Roder, Walter, to Messer Griesheim GmbH. Guidance device for a laser beam for three-dimensional machining of workpiecescu4,694,139, Cl. 219-121.0LU.

Rodgers, Jeremy A., to Rank Cintel Limited. Video signals special effects generator with variable pixel sizecu4,694,345, Cl. 358-216.000.

Roe, Elverton O.; and Moore, C. Gregg, to Wooster Brush Company, The. Power paint sprayercu4,693,423, Cl. 239-332.000.

Roemer, Erich; Schopf, Eckhart; and Cezanne, Gunter, to Glyco-Metall-Werke Daelen & Loos GmbH. Plain journal bearingcu4,693,617, Cl. 384-282.000.

Rogers, Leroy K., Sr. Supercharger for automobile enginescu4,693,669, Cl. 415-143.000.

Rohde, Bruno. Device for stabilizing magnetic zonescu4,694,271, Cl. 335-302.000.

Rohm and Haas Company: *See*—
Patterson, Dennis R., 4,693,742, Cl. 71-86.000.

Rohra, Alois; and Wildner, Walter, to MTU Motoren-und Turbinen-Union Muenchen GmbH. Bearing for a fluid flow engine and method for damping vibrations of the enginecu4,693,616, Cl. 384-99.000.

Rohrig, Lothar: *See*—
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Rokus, B. Joseph: *See*—
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Rolls-Royce plc: *See*—
Pidcock, Anthony; and Wray, Andrew P., 4,693,074, Cl. 60-39.320.
Williams, John E. F.; and Lang, Jack, 4,693,201, Cl. 114-67.00R.

Romstadt, Douglas J.; and Seitz, William R., to Allied Corporation. Electronic controller for predetermined temperature coefficient heatercu4,694,145, Cl. 219-497.000.

Romswinkel, Horst: *See*—
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Roos, Otto: *See*—
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Root, John A.: *See*—
Szczesny, David S.; and Root, John A., 4,693,533, Cl. 439-350.000.

Rorer Pharmaceutical Corporation: *See*—
O'Donnell, John B., 4,693,059, Cl. 53-567.000.

Rosen, Frank L.: *See*—
DeCarlo, Frank S.; and Rosen, Frank L., 4,693,114, Cl. 73-178.00R.

Rosenberg, Helmut W. G., to Kendall Company, The. Nephrostomy catheter with formed tipcu4,693,703, Cl. 604-49.000.

Rosier, Brian K., to Sprague Electric Company. Logic controlled switch to alternate voltage sourcescu4,694,430, Cl. 365-189.000.

Rosier, Jean-Claude, to Societe Europeenne de Propulsion. Device for the restitution and/or analyzing of color images using line-type fiber optics cathode ray tubecu4,694,221, Cl. 315-10.000.

Ross, Cyrus A.; and Thurow, Eberhard, to Les Explosifs Nordex Ltee/Nordex Explosives Ltd. Wet loading explosivecu4,693,763, Cl. 149-8.000.

Ross, Nicholas V., to Ajax Magnethermic Corporation. Apparatus for overheating edges of skelp for the production of compression welded pipecu4,694,134, Cl. 219-10.790.

Ross Pulp and Paper Inc.: *See*—
Masse, Serge, 4,693,405, Cl. 226-91.000.

Rossi, Eva-Maria; and Tietze, Armin R., to International Business Machines Corporation. Magnetic recording disk with improved lubricant retentioncu4,693,908, Cl. 427-130.000.

Roth, Donald J., to Continental Can Company, Inc. Closure having a pull tab and a controlled seal width at the pull tabcu4,693,391, Cl. 220-359.000.

Rothermel, Otto: *See*—
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Roto-Finish Company, Inc.: *See*—
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Roussel UCLAF: *See*—
Bianchi, Mario, deceased; and Barzaghi, Fernando, 4,694,019, Cl. 514-461.000.
Nedelec, Lucien; Hamon, Gilles; Fauveau, Patrick; and Oberlander, Claude, 4,694,011, Cl. 514-323.000.

Routh, Kevin C.: *See*—
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Raphal, Francis; and Roy, Jean-Paul, 4,693,531, Cl. 439-512.000.

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Dadley, David A.; and Haskins, Peter J., 4,693,181, Cl. 102-307.000.

Royer, D. Jack, to Conoco Inc. Method using encapsulated flow improvers to reduce turbulencecu4,693,321, Cl. 137-13.000.

RPC Industries: *See*—
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Rudolph, Werner: *See*—
Willenberg, Heinrich; Pohlmeyer, Wilhelm; and Rudolph, Werner, 4,694,112, Cl. 568-842.000.

Ruger, Roderich, to Messerschmitt-Bolkow-Blohm GmbH. Photoelectric receiver with local brightness adaptationcu4,694,333, Cl. 358-113.000.

Ruiz, Ariel: *See*—
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Runshe, Clay R.: *See*—
Brett, Dennis A.; and Runshe, Clay R., 4,693,786, Cl. 202-83.000.

Russell Corporation: *See*—
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Russo, Vincent; and Heesch, Max O., to ITT Corporation. Headrest for an automotive vehicle seatcu4,693,515, Cl. 297-391.000.

Ryoke, Katsumi; Takahashi, Masatoshi; Yoneyama, Takashi; Nishikawa, Yasuo; and Tadokoro, Eiichi, to Fuji Photo Film Co., Ltd. Magnetic recording mediumcu4,693,929, Cl. 428-323.000.

Ryschka, Martin: *See*—
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Rzad, Stefan J.: *See*—
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Rzeszewski, Theodore S.: *See*—
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S.A.T. (Societe Anonyme de Telecommunications): *See*—
Midavaine, Thierry, R.; and Ouhayoun, Michel M., 4,694,458, Cl. 372-32.000.

Saari, Walfred S.: *See*—
Engelhardt, Edward L.; and Saari, Walfred S., 4,694,020, Cl. 514-535.000.

SAB Nife AB: *See*—
Frode, Per E., 4,693,535, Cl. 439-277.000.

Sabate, Modeste; and Masse, Joel. Particular method for treating articles made of corkcu4,693,757, Cl. 134-27.000.

Sabatiuk, Andrew. Gas turbine engines employing fixed volume combustioncu4,693,075, Cl. 60-39.390.

Sackett, Robert R. Fluid flow and level detectorcu4,694,161, Cl. 250-231.00R.

Saeki, Yukio; Inoue, Naomitsu; and Tokunaga, Yukio, to Sumitomo Durez Company, Ltd. Manufacturing method for phenol resin foamcu4,694,028, Cl. 521-110.000.

Sagstetter, William E.: *See*—
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Sahara, Hiroshi: *See*—
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Saijo, Takao; and Fujita, Masafumi, to Minolta Camera Kabushiki Kaisha. Microfilm and microfilm printercu4,693,591, Cl. 355-41.000.

Saijo, Takemi: *See*—
Manabe, Seiichiro; Sawano, Tsutomu; and Saijo, Takemi, 4,693,739, Cl. 65-21.400.

Saiki, Atsushi; Suzuki, Michio; Sunami, Hideo; Asai, Shojiro; Maki, Michiyoshi; and Asami, Kinichiro, to Hitachi Plant Engineering & Construction Co., Ltd.; and Hitachi, Ltd. Clean roomcu4,693,173, Cl. 98-31.500.

Saint Gobain Vitrage: *See*—
Kerherve, Jean-Pierre; and Queromes, Armel, 4,694,091, Cl. 556-104.000.
Noiret, Robert; and Zortea, Michel, 4,693,740, Cl. 65-135.000.

Saito, Masaki: *See*—
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Saito, Masayuki: *See*—
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Saito, Seiji: *See*—
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Saito, Shinji: *See*—
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Saito, Takashi: *See*—
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Saito, Tutomu; and Yoneda, Hitoshi, to Kabushiki Kaisha Toshiba. Method and apparatus of electrophotographycu4,694,310, Cl. 346-153.100.

Saitoh, Satoshi: *See*—
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Sakai Chemical Industry Co., Ltd.: *See*—
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Sakai, Takamasa, to Dainippon Screen Mfg. Co., Ltd. Feeder of oxygen gas containing steamcu4,693,208, Cl. 118-724.000.

Sakai, Yoshiaki: *See*—
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Sakai, Yukio: *See*—
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Sakaino, Michio: *See*—
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Sakoe, Hiroaki, to NEC Corporation. Speaker verification systemcu4,694,493, Cl. 381-42.000.

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Sakurai, Hiroshi; and Iwasaki, Masami, to Kabushiki Kaisha Toshiba. Press-packed semiconductor devicecu4,694,322, Cl. 357-74.000.

Sakurai, Nobuo: *See*—
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Salas, Joseph; and Boix-Vives, Laurent, to Lange International S.A. Flexion control for ski bootcu4,693,020, Cl. 36-117.000.

Sales, Kenneth B., to Hubbell Incorporated. Reflector for roadway lighting luminairecu4,694,382, Cl. 362-346.000.

Salisbury, Richard; and Wyman, Stephen W., to Loctite Corporation. Curing oven for adhesivecu4,694,180, Cl. 250-455.100.

Salokangas, Arto, to Oy Ekofinn Ab. Biological filter heating arrangement for treatment of waste watercu4,693,816, Cl. 210-150.000.

Salsbury, Ronald L.: *See*—
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Salton, Robert B.: *See*—
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Samsonite Corporation: *See*—
King, William L.; and Weisbart, Charles K., 4,693,368, Cl. 206-287.100.

Sand, Douglas S.: *See*—
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Sanden Corporation: *See*—
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Sanders Associates, Inc.: *See*—
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Sanders, Robert E.; Knipp, Jerry L.; and Flynn, Charles J., to Hallmark Cards, Inc. Electrical ornamentation systemcu4,693,541, Cl. 439-541.000.

Sane, Ajit Y., to Eltech Systems Corporation. Preparation and sintering of refractory metal borides, carbides and nitrides of high purity-cu4,693,989, Cl. 501-96.000.

Sanji, Koichiro: *See*—
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Sanshin Kogyo Kabushiki Kaisha: *See*—
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Sansone, Michael J., to Celanese Corporation. Process for the production of polybenzimidazole ultrafiltration membranescu4,693,824, Cl. 210-500.280.

Santa Barbara Research Center: *See*—
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Santalucia, John: *See*—
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Sanyo Electric Co.: *See*—
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Sasagaki, Nobuaki; and Fujii, Hidekatsu, to Nippon Kogaku K.K. Focusing screen mounting device in a cameracu4,693,577, Cl. 354-155.000.

Sasaki, Isao; Nishida, Kozi; Morimoto, Masaru; and Yamamoto, Takashi, to Mitsubishi Rayon Company Ltd. Light-transmitting fibercu4,693,553, Cl. 350-96.340.

Sasaki, Kunihiko; Kodera, Masao; and Kuno, Akira, to Nippon Soken, Inc.; and Nippondenso Co., Ltd. Vehicle approach sensing apparatuscu4,694,296, Cl. 340-904.000.

Sasaki, Yoshiyuki: *See*—
Shiomi, Kengo; Sasaki, Yoshiyuki; and Kato, Toshiyuki, 4,694,305, Cl. 346-76.0PH.

Sasano, Akiyoshi: *See*—
Hanyu, Susumu; Hara, Kazumasa; Sasano, Akiyoshi; and Koike, Mikio, 4,693,193, Cl. 112-121.110.

Sasdi, Andras: *See*—
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Oehler, Henry; Peth, Norbert; Holpp, Hans W.; and Sass, Wolfgang, 4,693,017, Cl. 34-58.000.

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Shimizu, Isoo; Hirano, Ryotaro; Matsumura, Yasuo; Nomura, Hideki; Uchida, Kazumichi; and Sato, Atsushi, 4,694,100, Cl. 560-105.000.

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Sato, Tsutomu; Murayama, Noboru; and Sato, Key, 4,694,353, Cl. 358-283.000.

Sato, Kiyoshi: *See*—
Hirata, Tadashi; Mochida, Kenichi; Shiraki, Chihiro; and Sato, Kiyoshi, 4,694,001, Cl. 514-210.000.

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Hirai, Yoichi; Fujii, Tsunenori; Koto, Kaoru; Suzuki, Kenji; Yoshida, Masahiro; Okawa, Hisashi; Okabe, Yoshiaki; Kitamura, Teruo; Yokokura, Hisao; Hattori, Shintaroo; Mukoh, Akio; and Sato, Mikio, 4,694,098, Cl. 560-59.000.

Sato, Shiro: *See*—
Tsuetaki, George F.; and Sato, Shiro, 4,693,572, Cl. 351-161.000.

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Sato, Yoichi: *See*—
Nishikawa, Masao; Sakurai, Yoshimi; Aoki, Takashi; and Sato, Yoichi, 4,693,347, Cl. 192-3.300.

Satoh, Takao: *See*—
Seita, Toru; Satoh, Takao; and Kikuchi, Mitsuo, 4,693,796, Cl. 204-98.000.

Satou, Yasuo, to Toyota Jidosha Kabushiki Kaisha. Multi-fuel injection system for an internal combustion enginecu4,693,227, Cl. 123-575.000.

Sattlegger, Hans: *See*—
von Bonin, Wulf; Sattlegger, Hans; and Ebneth, Harold, 4,694,030, Cl. 523-179.000.

Savage, Jack W.: *See*—
Elliott, James O.; and Savage, Jack W., 4,694,210, Cl. 310-68.00R.

Sawada, Ichiro, to Nippon Gakki Seizo Kabushiki Kaisha. Wooden frame for a grand pianocu4,693,159, Cl. 84-186.00R.

Sawano, Tsutomu: *See*—
Manabe, Seiichiro; Sawano, Tsutomu; and Saijo, Takemi, 4,693,739, Cl. 65-21.400.

Sawtell, Ralph R.: *See*—
Bretz, Philip E.; Petit, Jocelyn I.; Sawtell, Ralph R.; and Vasudevan, Asuri K., 4,693,747, Cl. 75-249.000.

Saxena, Brij B.; and Rathnam, Premila, to Cornell Research Foundation, Inc. Reagent for use in a sandwich solid-phase enzyme-immunoassay and process for employing samecu4,693,969, Cl. 435-7.000.

Scarselletta, Louis, to General Motors Corporation. Tube and fin heat exchanger with hybrid heat transfer fin arrangementcu4,693,307, Cl. 165-152.000.

Schamel, Alfred H.: *See*—
Mallory, Robert L.; Schamel, Alfred H.; and Sekel, Stephen M., 4,694,380, Cl. 361-424.000.

Scharnberg, Lorne C.; and Devanathan, Deva, to Katecho, Incorporated. Device for surgically repairing soft tissues and method for making the samecu4,693,720, Cl. 623-11.000.

Schaudt Maschinenbau GmbH: *See*—
Vetter, Ulrich, 4,693,038, Cl. 51-165.720.

Scheffler, Charles E.: *See*—
Lescoe, Paul J.; and Scheffler, Charles E., 4,693,320, Cl. 169-61.000.

Schenck, Robert R.; and Weinrib, Harry P. Anastomosis device and methodcu4,693,249, Cl. 128-334.00R.

Scheper, John S.: *See*—
Trinh, Toan; and Scheper, John S., 4,693,840, Cl. 252-174.230.

Schetter, Klaus-Herbert: *See*—
Hirth, Antoine; and Schetter, Klaus-Herbert, 4,694,463, Cl. 372-61.000.

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Almond, Jeffrey W.; Minor, Phillip D.; Evans, David M. A.; and Schild, Geoffrey C., 4,694,071, Cl. 530-329.000.

Schilperoort, Robbert A.; and Hille, Jacques. Process for the incorporation of foreign DNA into the genome of dicotyledonous plants using stable cointegrate plasmidscu4,693,976, Cl. 435-172.300.

Schindler, Manfred; and Vilsmeier, Walter, to FICHT GmbH. Wheel suspension using an arc springcu4,693,492, Cl. 280-705.000.

Schlenk, Manfred; and Chadwick, P. N. R., to Siemens Aktiengesellschaft. Fault recognition circuit for parallel power supply devices feeding a usercu4,694,193, Cl. 307-62.000.

Schlick, Horst D., to Schlick Roto-Jet Maschinenbau GmbH. Method and retort for the removal of carbonizable coatings from the surfaces of metal objectscu4,693,756, Cl. 134-7.000.

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Schmalbach-Lubeca AG: *See*—
Bolte, Georg, 4,693,801, Cl. 204-180.200.

Schmid, Wolfgang: *See*—
Buck, Manfred; Fehrle, Siegfried; Holzel, Martin; Kabatnik, Wilfried; Schmid, Wolfgang; and Wanner, Karl, 4,693,407, Cl. 227-109.000.

Schmidt, Dieter: *See*—
Breusinger, Manfred; and Schmidt, Dieter, 4,694,084, Cl. 546-25.000.

Schmidt, Gunter P., to G-A-T-M Corporation. Aerial terminal for telecommunication cablescu4,694,118, Cl. 174-41.000.

Schmidt, Wilfried: *See*—
Friedrich, Gerda; Rasch, Klaus-Dieter; and Schmidt, Wilfried, 4,694,117, Cl. 136-256.000.

Schmiesing, John: *See*—
Leung, Howard K. H.; Nguyen, Bich-Yen; Alvis, John R.; and Schmiesing, John, 4,693,781, Cl. 156-643.000.

Schmitt, Armin, to Luwa AG. Process for sterilizing a cocoa pastecu4,693,904, Cl. 426-521.000.

Schmitt, Rudiger: *See*—
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Stetter, Karl O.; and Schmitt, Rudiger, 4,693,979, Cl. 435-199.000.
Stetter, Karl O.; Schmitt, Rudiger; and Laue, Frank, 4,693,980, Cl. 435-199.000.

Schmitz, Thomas R.: *See*—
Pettus, Ronald G.; and Schmitz, Thomas R., 4,693,497, Cl. 285-12.000.

Schneider, Rolf: *See*—
Oehsen, Ubbo v.; Stecher, Karlheinz; Koehler, Waldemar; Mueller, Berthold; Brunnmueller, Fritz; and Schneider, Rolf, 4,693,877, Cl. 423-373.000.

Schnorrenberger, Gerd: *See*—
Losel, Walter; Roos, Otto; and Schnorrenberger, Gerd, 4,694,085, Cl. 546-65.000.

Schoenecker, David L.: *See*—
Kellett, James H.; Gaddis, Raymond W.; Fritts, Robert W.; and Schoenecker, David L., 4,693,949, Cl. 429-178.000.

Schopf, Eckhart: *See*—
Roemer, Erich; Schopf, Eckhart; and Cezanne, Gunter, 4,693,617, Cl. 384-282.000.

Schrankel, Kenneth R.: *See*—
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,693,890, Cl. 424-78.000.

Schriefer, Judy: *See*—
Degen, Peter J.; Martin, Jerold; Schriefer, Judy; and Shirley, Brenda, 4,693,985, Cl. 436-531.000.

Schroeer, Bernhard, to Deutsche ITT Industries GmbH. Integrable circuit for identifying a pilot tonecu4,694,495, Cl. 381-15.000.

Schubert, Rainer; and Weber, Otto, to Vereinigte Schraubenwerke GmbH; Schubert, Rainer; and Weber, Otto. Mounting element for a flat insulating body which can be attached to a thin-walled basecu4,693,653, Cl. 411-387.000.

Schue, Thomas J.: *See*—
Niksa, Marilyn J.; Pohto, Gerald R.; Lakatos, Leslie K.; Wheeler, Douglas J.; Solomon, Frank; Niksa, Andrew J.; Schue, Thomas J.; Genodman, Yury; Turk, Thomas R.; and Hagel, Daniel P., 4,693,946, Cl. 429-27.000.

Schuh, Gisela, Sabine Schuh, Michael Schuh, heirs: *See*—
Diegel, Dieter; Plohn, Gerhard; and Schuh, Manfred, deceased, 4,694,188, Cl. 290-40.00B.

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Schulte, Thomas H.: *See*—
Mansour, James D.; Schulte, Thomas H.; and Neece, Vernon R., 4,693,972, Cl. 435-34.000.

Schultes, Otto, to Statomat-Globe Maschinenfabrik GmbH. Device for the lining of slots of stator or rotor lamination packs for electrical machines with slot linerscu4,692,972, Cl. 29-33.00L.

Schultz, Alvin L.: *See*—
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Schulz-Hennig, Joerg; and Sievers, Horst, to Dr. Ing. Rudolf Hell GmbH. Method and apparatus for acoustic supervision of adjustment operations at optical devicescu4,694,150, Cl. 250-201.000.

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Schulz, Richard: *See*—
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Schwaiger, Kurt: *See*—
Heuwieser, Erwin; and Schwaiger, Kurt, 4,694,207, Cl. 307-571.000.

Schwartz, Anthony M.; Kawashima, Norimichi; and Zettlemoyer, Albert C., to Lehigh University. Lithographic plates and production process thereforcu4,693,958, Cl. 430-302.000.

Schwartzman, Gilbert, to Dab-O-Matic Corp. Pressure-responsive valve for an applicatorcu4,693,623, Cl. 401-206.000.

Schwarz, Alexander: *See*—
Kleiner, Hans-Jerg; Kloss, Gerhard; Molter, Michael; Schwarz, Alexander; and Thamm, Horst-Dieter, 4,693,884, Cl. 424-1.100.

Schwarz, Jurgen, to Carl-Zeiss-Stiftung. Readiness indicator for laser medical instrumentscu4,694,290, Cl. 340-815.210.

Schwebel Adolf; and Herrmann, Herbert, to Mabeg Maschinenbau GmbH & Company. Apparatus for the lateral registration of sheetscu4,693,463, Cl. 271-236.000.

Schweers, Karl D. Preform handling apparatuscu4,693,375, Cl. 209-544.000.

Schweiger, Raymond H. Method for topical treatment of scar tissuecu4,694,021, Cl. 514-544.000.

Schweiker, Werner, to Hermann Behr & Sohn GmbH & Co. Program-controlled industry robot in particular laquering (or painting) robotcu4,693,664, Cl. 414-735.000.
Schwengers, Dieter; and Benecke, Herta, to Pfeifer & Langen. Processes for producing leucrosecu4,693,974, Cl. 435-97.000.
Schwenzer, Michael; Eskam, Armin; Simon, Walter; and Becker, Wilfried, to Rheinmetall GmbH. Self-deploying stabilizing-vane assembly for projectilecu4,693,434, Cl. 244-328.000.
Scientific Drilling International: *See*—
Moll, Helmut, 4,694,439, Cl. 367-83.000.
Scifres, Donald R.: *See*—
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Scott, Andrew M.: *See*—
Westerman, David W. B.; and Scott, Andrew M., 4,693,807, Cl. 208-108.000.
Scott, Eugene E., Sr. Legrest and footrest for bedscu4,692,954, Cl. 5-443.000.
Scripps, Keith A. Combination electrical light, smoke and/or heat detectorcu4,694,285, Cl. 340-693.000.
Sczomak, David P., to General Motors Corporation. Poppet covered orifice fuel injection nozzlecu4,693,424, Cl. 239-453.000.
Seaboard Wellhead Control, Inc.: *See*—
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Sebille, Bernard; Beuzard, Yves; and Demarne, Henri, to Sanofi; and Institut National de la Sante et de la Recherche Medicale (Inserm). Pharmaceutical or veterinary compositions containing thiosulfonate derivativescu4,694,015, Cl. 514-375.000.
Segoshi, Toru, to Nissan Motor Company, Limited. Lamp power supply control system for an automotive vehiclecu4,694,191, Cl. 307-10.0LS.
Sehr, Willibald, to MOBA-Electronic Gesellschaft fur Mobil-Automation mbH. Opto-electronic measuring receiver and method for controlling the opto-electronic measuring receivercu4,693,598, Cl. 356-4.000.
Seiffge, Dirk: *See*—
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Seiko Instruments & Electronics Ltd.: *See*—
Harada, Takamasa; and Taguchi, Masaaki, 4,693,563, Cl. 350-350.00S.
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Seikosha Co., Ltd.: *See*—
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Seita, Toru; Satoh, Takao; and Kikuchi, Mitsuo, to Toyo Soda Manufacturing Co., Ltd. Method for manufacturing cation exchange membranecu4,693,796, Cl. 204-98.000.
Seitz, William R.: *See*—
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Sekel, Stephen M.: *See*—
Mallory, Robert L.; Schamel, Alfred H.; and Sekel, Stephen M., 4,694,380, Cl. 361-424.000.
Seki, Yoichi: *See*—
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Seki, Yoshizo, to Tomy Kogyo Co., Inc. Toy with moving screencu4,693,694, Cl. 446-197.000.
Seltzer, Samuel M.; Dennison, Saul; and Dolan, Frank, Sr., to Allison Corporation. Auto seat covercu4,693,511, Cl. 297-219.000.
Selz, Aloiz, to Surculus AG. Drinking cup with closure for open bottles and/or canscu4,693,410, Cl. 229-1.50B.
Semiconductor Energy Laboratory Co., Ltd.: *See*—
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Sendax, Victor I. Magnetic dental implant retention systemcu4,693,686, Cl. 433-173.000.
Seng, Richard L.: *See*—
Collins, Michael S.; Tsay, Grace C.; and Seng, Richard L., 4,693,891, Cl. 424-92.000.
Sengupta, Mrinal K., to Exxon Production Research Company. Time-offset-frequency-amplitude panels for seismic identification of hydrocarbonscu4,694,438, Cl. 367-70.000.
Sensui, Reiichiro: *See*—
Hazano, Shigeki; Shibagaki, Masahiro; Jyo, Hidetaka; Sensui, Reiichiro; Iwami, Munenori; and Suzuki, Noboru, 4,693,777, Cl. 156-345.000.
Serve, Klaus, to Manibs. R. Mannesmann GmbH. & ibs Nagel GmbH. & Co. KG. Pipeline for gaseous fluids and method of assembling its componentscu4,693,499, Cl. 285-96.000.
Serwer, Philip, to Board of Regents, The University of Texas System. Apparatus for bidimensional electrophoretic separationscu4,693,804, Cl. 204-182.100.
Seto, Junetsu: *See*—
Tamura, Shinichiro; and Seto, Junetsu, 4,693,962, Cl. 430-345.000.
Setzer, Herbert J.; Karavolis, Sam; and Bett, John A. S., to International Fuel Cells Corporation. Steam reforming utilizing sulfur tolerant catalystcu4,693,882, Cl. 423-652.000.
Sewards, Alan, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Remote identification devicecu4,694,297, Cl. 342-45.000.
Seya, Hirokatsu: *See*—
Maeda, Akio; Chida, Takeshi; and Seya, Hirokatsu, 4,694,067, Cl. 528-393.000.
SGS Microelettronica S.p.A.: *See*—
Marchio', Fabio; and Menniti, Pietro, 4,694,239, Cl. 323-285.000.
Shackleton, Raymond T., to Butler Newall Machine Tool Company Limited. Drive mechanisms for rotating crankshafts for use in machine toolscu4,693,147, Cl. 82-40.00A.
Shah, Kishore R., to Kendall Company, The. Microphase separated hydrogels for controlled release of bioactive materialscu4,693,887, Cl. 424-19.000.
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Wheatley, Thomas A.; and Shah, Rashminkumar S., 4,693,896, Cl. 424-480.000.
Shanahan, Michael J.: *See*—
Berg, Lloyd; and Shanahan, Michael J., 4,693,787, Cl. 203-51.000.
Berg, Lloyd; and Shanahan, Michael J., 4,693,788, Cl. 203-51.000.
Shanks, Ernest R.; and Carnes, Gerald L. Bumper guide assembly for elevator doorscu4,693,340, Cl. 187-52.00R.
Shapiro, Ian M.: *See*—
O'Mara, Raymond D.; and Shapiro, Ian M., 4,693,091, Cl. 62-272.000.
Shapiro, Rafael, to Du Pont de Nemours, E. I., and Company. Herbicidal ortho-(azinyl)-benzenesulfonamidescu4,693,744, Cl. 71-93.000.
Sharp Kabushiki: *See*—
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Harada, Munenori, 4,694,288, Cl. 340-721.000.
Hayakawa, Toshiro; Suyama, Takahiro; Takahashi, Kohsei; and Yamamoto, Saburo, 4,693,207, Cl. 118-715.000.
Hayakawa, Toshiro; Suyama, Takahiro; and Yamamoto, Saburo, 4,694,460, Cl. 372-45.000.
Hirano, Takaaki; Kamuro, Setsufumi; Yamaguchi, Akira; Tanimoto, Junichi; and Okada, Mikiro, 4,694,393, Cl. 364-200.000.
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Takeda, Makoto; Yamamoto, Kunihiko; Matsubayashi, Nobuaki; and Take, Hiroshi, 4,694,349, Cl. 358-241.000.
Yano, Seiki; Yamamoto, Saburo; Matsui, Sadayoshi; and Taneya, Mototaka, 4,694,461, Cl. 372-50.000.
Shaw, Jane M.: *See*—
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Shell Internationale Maatschappij, B.V.: *See*—
Muijs, Herman M.; and Keijzer, Paulus P. M., 4,693,311, Cl. 166-272.000.
Shell Oil Company: *See*—
Baker, Daniel C., 4,693,873, Cl. 423-215.500.
Dewitz, Thomas S., 4,693,808, Cl. 208-113.000.
Westerman, David W. B.; and Scott, Andrew M., 4,693,807, Cl. 208-108.000.
Shen, Virginia A.: *See*—
Blatherwick, William J.; Hamilton, Leslie; Holewinski, Robert D.; Shen, Virginia A.; Kapec, Jeffrey; and Tanaka, Kazuna, 4,693,684, Cl. 433-90.000.
Sherwood Medical Company: *See*—
George, Robert D.; and Banning, Robert D., 4,693,709, Cl. 604-212.000.
McCool, George W., 4,693,710, Cl. 604-283.000.
Talonn, Daniel A., 4,693,256, Cl. 128-725.000.
Shiba Seisakusho Limited Responsibility Company: *See*—
Matsuo, Hiroyoshi, 4,693,538, Cl. 439-460.000.
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Shibui, Michiro; Hanamoto, Yoshihiro; Ishigaki, Yoshio; Sahara, Hiroshi; Maeda, Satoru; and Noguchi, Yasushi, to Nippon Telegraph & Telephone; and Sony Corporation. Apparatus for displaying scrolling imagescu4,694,406, Cl. 364-518.000.
Shigaki, Takao, to Fuji Photo Film Co., Ltd. Method of determining exposurescu4,693,596, Cl. 355-77.000.
Shigematsu, Toshifumi: *See*—
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Shigemoto, Hiromi; Yamamoto, Akio; and Suzuki, Iwatoshi, to Mitsui Petrochemical Industries, Ltd. Flat die neck-in control devicecu4,693,677, Cl. 425-376.00R.
Shigenobu, Michio; and Saito, Takashi, to Canon Kabushiki Kaisha. Image forming apparatuscu4,693,587, Cl. 355-3.0FU.
Shilo, Moshe; and Fattom, Ali, to Solmat Systems, Ltd.; and Yissum Research Development Company of the Hebrew University of Jerusalem. Cyanobacterium-produced bioemulsifier composition and solution thereofcu4,693,842, Cl. 252-356.000.
Shimada, Jiroh; and Morito, Hiroshi, to NEC Corporation. Data comparison circuit constructed with smaller number of transistorscu4,694,274, Cl. 340-146.200.
Shimamoto, Grant T.: *See*—
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Shimamura, Masaharu: *See*—
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Shimatani, Toshimichi; and Kawata, Yoshihiro, to Iwatsu Electric Co. Ltd. Data transmission circuitcu4,694,470, Cl. 375-37.000.

Shimazaki, Norihiko: *See*—
Nakaguti, Osamu; Shimazaki, Norihiko; Kawai, Yoshio; Hashimoto, Masashi; and Nakatuka, Michie, 4,694,004, Cl. 514-228.000.

Shimizu, Isoo; Hirano, Ryotaro; Matsumura, Yasuo; Nomura, Hideki; Uchida, Kazumichi; and Sato, Atsushi, to Nippon Petrochemicals Company, Ltd. Method for producing α-(p-isobutylphenyl)propionic acid or its alkyl esterscu4,694,100, Cl. 560-105.000.

Shimizu, Tsutomu; Miyata, Jun; and Yagii, Koji, to Mazda Motor Corporation. Apex seal for rotary piston enginescu4,693,942, Cl. 428-614.000.

Shimoda, Kazuho; and Abe, Shunichi, to Konishiroku Photo Industry Co., Ltd. Sheet feeding system in recording apparatuscu4,693,459, Cl. 271-9.000.

Shimotori, Kazuhiro: *See*—
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Shimoyama, Kazuhiko: *See*—
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Shin-Etsu Chemical Co., Ltd.: *See*—
Imai, Kiyokazu; Shiomi, Tomoo; and Tezuka, Yasuyuki, 4,694,077, Cl. 536-92.000.
Itoh, Kenichi; Noguki, Genji; Tanaka, Motoaki; and Ohba, Hitoshi, 4,694,053, Cl. 526-74.000.
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Shindou, Norikazu, to Tokyo Juki Industrial Co., Ltd. Moving element body apparatus of linear motor and method for producing itcu4,694,209, Cl. 310-12.000.

Shinoto, Yoshinori, to Linguatron Limited. Casing for electronic apparatuscu4,693,525, Cl. 312-208.000.

Shiomi, Kengo; Sasaki, Yoshiyuki; and Kato, Toshiyuki, to Tokyo Juki Industrial Co., Ltd. Multi-colored stacked cassettes thermal printercu4,694,305, Cl. 346-76.0PH.

Shiomi, Tomoo: *See*—
Imai, Kiyokazu; Shiomi, Tomoo; and Tezuka, Yasuyuki, 4,694,077, Cl. 536-92.000.

Shiomi, Yasuhiko; and Suzuki, Ryoichi, to Canon Kabushiki Kaisha. Distance measuring device with signal processing circuit for position sensitive detectorcu4,693,597, Cl. 356-1.000.

Shiono, Manzo; Fujita, Yoshiji; and Nishida, Takashi, to Kuraray Co., Ltd. Chroman compounds useful as analgerics and antioxidantscu4,694,090, Cl. 549-407.000.

Shirai, Yuji: *See*—
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Mui, Shou Y., 4,694,467, Cl. 375-1.000.

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Small, Kenneth T., to Boschert, Incorporated. Proportional transistor base drive circuit for use in power converters and components thereofcu4,694,389, Cl. 363-132.000.
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Smith, Earl D. Trailer apparatus for transporting vehicles and other cargocu4,693,650, Cl. 410-18.000.
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Shilo, Moshe; and Fattom, Ali, 4,693,842, Cl. 252-356.000.
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Sommer, Gordon M., to Sommer Co. Clutch-brake unitcu4,693,350, Cl. 192-18.00A.
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Spiegel, Raymond W., to Whirlpool Corporation. Appliance support-cu4,693,526, Cl. 312-250.000.
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Stauffer, Nelson R., to Kamel Corporation. High speed tail sealing apparatuscu4,693,766, Cl. 156-64.000.
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Steigerwald, Robert L.; Routh, Kevin C.; Claydon, Glenn S.; and Bicknell, William H., to General Electric Company. HVIC power supply controller with primary-side edge detectorcu4,694,384, Cl. 363-17.000.
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Stephenson, Edgar O.; and Howe, Raymond C., to Kawasaki Thermal Systems, Inc. Insulated wellbore casingcu4,693,313, Cl. 166-302.000.
Stephenson, Fred W. Shrimp processing method and devicecu4,692,965, Cl. 17-48.000.
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Sugawara, Mitsutoshi: *See*—
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Sugimori, Masaru; and Sanji, Koichiro, to Sunstar Giken Kabushiki Kaisha. Polyurethane resin compositioncu4,694,093, Cl. 556-413.000.
Sugimoto, Mamoru: *See*—
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Sugisawa, Taijiro; and Nishiyama, Akio, to Mitsubishi Kinzoku Kabushiki Kaisha. Surface-coated wear-resistant member of cermet and process for producing samecu4,693,944, Cl. 428-698.000.
Sugiura, Yasuyuki: *See*—
Mizunoya, Nobuyuki; Kohama, Hajime; and Sugiura, Yasuyuki, 4,693,409, Cl. 228-122.000.
Sugiyama, Jun; Hagino, Kiyoshi; and Usui, Akira, to Nippon Gakki Seizo Kabushiki Kaisha. Data transmission systemcu4,694,293, Cl. 340-825.680.
Sugiyama, Katsuhiko; Kawazoe, Hiromitsu; and Idota, Yoshinori, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Inlet port for internal combustion enginecu4,693,215, Cl. 123-188.00M.
Sugiyama, Tadashi: *See*—
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Sugouchi, Akira, to Nippon Gakki Seizo Kabushiki Kaisha. Archery bow handle risercu4,693,230, Cl. 124-88.000.
Sullivan, James V.: *See*—
Minton, Allen P.; Attri, Arun K.; and Sullivan, James V., 4,693,984, Cl. 436-180.000.
Sulosky, William P.; and Evans, Raymond D., Jr., to Kennametal, Inc. Means for holding cutter bitscu4,693,518, Cl. 299-93.000.
Sulzbach, Hans-Michael: *See*—
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Deeg, Helmut; and Imhof, Christian, 4,693,176, Cl. 98-40.120.
Imhof, Christian; and Kempf, Gerhard, 4,693,069, Cl. 57-59.000.
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Uemura, Yahiro; Ohmura, Takao; Ohmizu, Akimasa; Sumi, Akinori; Ohtani, Wataru; Sakanishi, Yoshitaka; Morise, Hiroshi; Arimura, Hirofumi; and Suyama, Tadakazu, 4,694,074, Cl. 530-417.000.
Sumida, Yasuji; Kajita, Hiroshi; and Fujioka, Tadashi, to Mita Industrial Co., Ltd. Electrostatic copying apparatuscu4,693,586, Cl. 355-3.0SH.
Sumitomo Bakelite Company Limited: *See*—
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Sumitomo Chemical Company, Limited: *See*—
Yamauchi, Noriaki; Ikeou, Shinnei; and Imada, Kunihiko, 4,693,725, Cl. 8-527.000.
Sumitomo Durez Company, Ltd.: *See*—
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Nakai, Tetsuo; and Goto, Mitsuhiro, 4,693,746, Cl. 75-238.000.
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Sumitomo Metal Industries, Ltd.: *See*—
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Sumiya, Koji: *See*—
Kobayashi, Koji; Sumiya, Koji; Taga, Yutaka; and Watanabe, Kazuaki, 4,693,353, Cl. 192-85.0AA.
Sumser, Siegfried, to Daimler-Benz Aktiengesellschaft. Device for increasing the rotational speed of an exhaust gas turbo-charger on an internal combustion enginecu4,693,085, Cl. 60-611.000.

Sunami, Hideo: *See—*
Moniwa, Masahiro; Warabisako, Terunori; and Sunami, Hideo, 4,692,994, Cl. 437-40.000.
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Blackburn, Ronald, 4,693,073, Cl. 60-39.020.
Lang, David J.; Layer, John C.; and Durtschi, William G., 4,693,352, Cl. 192-70.270.
Nguyen, Vietson M.; and Dhyanchand, P. John, 4,694,383, Cl. 363-17.000.
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Upadhyay, Anand; and Messenger, Lawrence W., 4,694,236, Cl. 318-798.000.
Sundstrand Data Control, Inc.: *See—*
Groenewegen, Johannes B., 4,694,119, Cl. 174-52.0PE.
Sunkist Growers Inc.: *See—*
Conway, Tim D., 4,693,607, Cl. 356-380.000.
Sunstar Giken Kabushiki Kaisha: *See—*
Sugimori, Masaru; and Sanji, Koichiro, 4,694,093, Cl. 556-413.000.
Supafit Gymnasium Equipment Pty, Limited: *See—*
Dofel, Andrew W. R., 4,693,471, Cl. 272-136.000.
Superior Industries International, Inc.: *See—*
Brown, Raymond C., 4,693,520, Cl. 301-37.0SS.
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Selz, Aloiz, 4,693,410, Cl. 229-1.50B.
Surgical Laser Technologies, Inc.: *See—*
Daikuzono, Norio, 4,693,244, Cl. 128-303.100.
Sutherland, James F.: *See—*
Hasenkopf, Joel E.; and Sutherland, James F., 4,694,415, Cl. 364-724.000.
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Suyama, Tadakazu: *See—*
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Suyama, Takahiro: *See—*
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Suzuka, Susumu: *See—*
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Suzuki, Fuminori: *See—*
Kamiya, Kiyoshi; Shiraishi, Atsushi; and Suzuki, Fuminori, 4,694,348, Cl. 358-236.000.
Suzuki, Haruko: *See—*
Oodaira, Hirosi; Suzuki, Haruko; Saito, Masayuki; and Ohuchi, Masayuki, 4,694,138, Cl. 219-121.0LM.
Suzuki, Hayao; and Matsuoka, Yoshiharu, to Seiko Instruments & Electronics Ltd. Robot controlling systemcu4,694,232, Cl. 318-568.000.
Suzuki, Hidetoshi: *See—*
Ozawa, Kunitaka; Ayata, Naoki; Suzuki, Hidetoshi; Saito, Seiji; and Koumura, Noboru, 4,694,502, Cl. 382-17.000.
Suzuki, Iwatoshi: *See—*
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Suzuki, Kazunori: *See—*
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Suzuki, Kenji: *See—*
Hirai, Yoichi; Fujii, Tsunenori; Koto, Kaoru; Suzuki, Kenji; Yoshida, Masahiro; Okawa, Hisashi; Okabe, Yoshiaki; Kitamura, Teruo; Yokokura, Hisao; Hattori, Shintaroo; Mukoh, Akio; and Sato, Mikio, 4,694,098, Cl. 560-59.000.
Suzuki, Michio: *See—*
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Suzuki, Noboru: *See—*
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Suzuki, Ryoichi: *See—*
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Suzuki, Shinichi; Tokumo, Akio; Kunugi, Yoshiro; and Kato, Masayuki, to Pioneer Electronic Corporation. Automatic sound field correcting systemcu4,694,498, Cl. 381-103.000.
Suzuki, Tadashi; Futami, Toru; and Sakagami, Atsushi, to Nissan Motor Company, Limited. Synchronized network systemcu4,694,294, Cl. 340-825.140.
Suzuki, Takaya: *See—*
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Suzuki, Yoshio; Suzuki, Yoshio; Saitoh, Satoshi; Yamamoto, Mituoki; and Hosomi, Hisashi, to Takenaka Komuten Co., Ltd. Gravity type oceanic structure and its stable installationcu4,693,637, Cl. 405-224.000.
Suzuki, Yoshio: *See—*
Suzuki, Yoshio; Suzuki, Yoshio; Saitoh, Satoshi; Yamamoto, Mituoki; and Hosomi, Hisashi, 4,693,637, Cl. 405-224.000.
Suzuki, Yukio: *See—*
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Svedberg, Per, to ASEA-Aktiebolag. CMOS overvoltage protection circuit utilizing thyristor and majority carrier injecting anti-parallel diodecu4,694,315, Cl. 357-23.130.
Svyatsky, Eduard; and Rabindran, K. George, to Bell & Howell Company. Rotatable print mechanism for printing on front or back of mediacu4,693,465, Cl. 271-274.000.
Swanberg, Melvin E., to Xerox Corporation. Pixel placement sensing arrangement using split detecting elementscu4,694,156, Cl. 250-214.0RC.
Swapp, Mavin: *See—*
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Sweeney, Theodore J., to Theodore Sweeney & Company, Inc. Adhesively securable fastenercu4,693,652, Cl. 411-23.000.
Swengel, Robert C., Sr., to Donsco Inc. Oscillating device having improved support legs and demountable basecu4,693,466, Cl. 272-52.000.
SWF Auto Electric GmbH: *See—*
Bayha, Heiner; Kluge, Hermann; and Rachner, Horst, 4,694,211, Cl. 310-71.000.
Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; and Crowell, Jonathan C., to Kollmorgen Technologies Corporation. Apparatus for making scribed circuit boards and circuit board modificationscu4,693,778, Cl. 156-361.000.
Swiss Aluminium Ltd.: *See—*
Mittelmann, Gerhard, 4,693,345, Cl. 190-108.000.
Skaria, Arankathu; and Goeldi, Heinrich, 4,693,878, Cl. 423-334.000.
Szabo, Bela; Vagvolgyi, Jeno; and Feher, Istvan, to MTA Kozponti Fizikai Kutato Intezete. Current-impulse converter circuit with variable time constantcu4,694,208, Cl. 307-603.000.
Szczesny, David S.; and Root, John A., to AMP Incorporated. Ribbon cable connector with improved cover latchcu4,693,533, Cl. 439-350.000.
Sztaba, Lennard: *See—*
Keem, John E.; Ovshinsky, Stanford R.; Flessa, Steven A.; Wood, James L.; Hart, Keith L.; and Sztaba, Lennard, 4,693,933, Cl. 428-333.000.
T. D. Williamson, Inc.: *See—*
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T. Entrepreneur, Inc.: *See—*
Terhune, John J., 4,693,022, Cl. 36-132.000.
T K Valve & Manufacturing, Inc.: *See—*
Plow, Arthur E., 4,693,128, Cl. 74-104.000.
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Tadeka, Makoto: *See—*
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Tadokoro, Eiichi: *See—*
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Taga, Yutaka: *See—*
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Kobayashi, Koji; Sumiya, Koji; Taga, Yutaka; and Watanabe, Kazuaki, 4,693,353, Cl. 192-85.0AA.
Nakamura, Shinya; Kubo, Seitoku; and Taga, Yutaka, 4,693,081, Cl. 60-448.000.
Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Maeda, Koji; Watanabe, Kazuaki; and Taga, Yutaka, 4,693,348, Cl. 192-3.290.
Taguchi, Junji: *See—*
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Taguchi, Masaaki: *See—*
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Tahara, Teruji: *See—*
Yoshimura, Shushichi; Hiwatashi, Yasunori; Kobayashi, Hiromu; Yamazaki, Hozo; Nishino, Nobu; Tahara, Teruji; and Kobayashi, Hidenobu, 4,693,879, Cl. 423-461.000.
Tahara, Toshiro: *See—*
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Taika, Tadao: *See—*
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Taiyo Yuden Co., Ltd.: *See—*
Hayashi, Yutaka; Mishuku, Toshio; Yamanaka, Mitsuyuki; and Iida, Hideyo, 4,694,116, Cl. 136-256.000.
Takahashi, Akinori, to NEC Corporation. A/D convertercu4,694,277, Cl. 340-347.0NT.

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Takahashi, Jiro: *See*—
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Takahashi, Kozo, to Sharp Kabushiki Kaisha. Paper speed control in automatic document feedercu4,693,461, Cl. 271-176.000.
Takahashi, Masatoshi: *See*—
Ryoke, Katsumi; Takahashi, Masatoshi; Yoneyama, Takashi; Nishikawa, Yasuo; and Tadokoro, Eiichi, 4,693,929, Cl. 428-323.000.
Takahashi, Shiro, to Man Design Co., Ltd. Annular hole cuttercu4,693,644, Cl. 408-204.000.
Takahashi, Susumu, to Olympus Optical Co., Ltd. Image transmission optical system for an endoscopecu4,693,568, Cl. 350-469.000.
Takahata, Yasuyo; and Miyagawa, Ryuji, to Chemicals Inspection & Testing Institute. Partially hydrophilicized silica gel and process for producing the samecu4,694,092, Cl. 556-400.000.
Takakura, Mitsuro: *See*—
Okamoto, Tadashi; Shimoyama, Kazuhiko; Yamaoka, Hiromasa; and Takakura, Mitsuro, 4,694,419, Cl. 364-900.000.
Takasago Thermal Engineering Co., Ltd.: *See*—
Hashimoto, Takayoshi, 4,693,175, Cl. 98-31.600.
Takasu, Yoshio; Oguchi, Yoshihiro; and Katagiri, Kazuharu, to Canon Kabushiki Kaisha. Image forming method and image bearing membercu4,693,951, Cl. 430-31.000.
Takata, Koji; and Nishiyama, Yukinori, to Sumitomo Electric Industries, Ltd. Automobile braking force control apparatuscu4,693,521, Cl. 303-103.000.
Take, Hiroshi: *See*—
Takeda, Makoto; Yamamoto, Kunihiko; Matsubayashi, Nobuaki; and Take, Hiroshi, 4,694,349, Cl. 358-241.000.
Takeda, Makoto; Yamamoto, Kunihiko; Matsubayashi, Nobuaki; and Take, Hiroshi, to Sharp Kabushiki Kaisha. Liquid crystal matrix display panel driver circuitcu4,694,349, Cl. 358-241.000.
Takehara, Shin: *See*—
Akatsu, Yousuke; Yamaguchi, Hirotsugu; Fukushima, Naoto; Hano, Sunao; Sugino, Masaru; Takehara, Shin; and Matsui, Shinichi, 4,693,491, Cl. 280-688.000.
Takei, Hidetoshi; and Minami, Teruo, to Toyo Denki Seizo Kabushiki Kaisha and Komatsu Ltd. Collector device for trolley-assisted vehiclescu4,694,125, Cl. 191-87.000.
Takenaka Komuten Co., Ltd.: *See*—
Suzuki, Yoshio; Suzuki, Yoshio; Saitoh, Satoshi; Yamamoto, Mituoki; and Hosomi, Hisashi, 4,693,637, Cl. 405-224.000.
Takenaka, Shinji; and Oi, Ryu, to Mitsui Toatsu Chemicals, Inc. Process for production of m-phenoxybenzyl alcoholcu4,694,110, Cl. 568-638.000.
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Takeshita, Hajime; Iwase, Takahiro; Masuda, Naofumi; Sibata, Takuo; Mochizuki, Hiroyuki; Kobayashi, Nobuo; Kawakami, Seiho; and Kuroiwa, Yosio, to Toyota Jidosha Kabushiki Kaisha. Method of broaching outer periphery of lobe-type rotor of roots-type fluid machine, and broaching cutter used in the methodcu4,693,813, Cl. 409-244.000.
Takeuchi, Hiromi: *See*—
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Taki, Masaru; Okada, Hiroshi; Kawamura, Seijiro; Kusumoto, Akio; Morita, Koji; Ikenaga, Takao; Shigematsu, Toshifumi; and Iida, Masami, to Toto Ltd. Sanitary facility room for clean roomcu4,692,951, Cl. 4-664.000.
Talamantez, Rudolph, Sr. Ball-and-target game with tiltable playing surface thereforcu4,693,476, Cl. 273-110.000.
Talas, Eva E., to Pennwalt Corporation. Process for continuously dispensing liquid microbicides into metalworking fluidscu4,693,283, Cl. 141-1.000.
Taliq Corporation: *See*—
Wiley, Richard, 4,693,560, Cl. 350-335.000.
Tallgrass Technologies, Inc.: *See*—
Brent, George I., 4,694,367, Cl. 360-106.000.
Talonn, Daniel A., to Sherwood Medical Company. Respiratory devicecu4,693,256, Cl. 128-725.000.
Tamaru, Takuya; and Ogusu, Mikio, to Nippon Gakki Seizo Kabushiki Kaisha. Disc casecu4,694,448, Cl. 369-291.000.
Tami, Kazuya, to Tokyo Juki Industrial Co., Ltd. Sewing machine apparatus with improved shaft speed measuring and indicating meanscu4,693,197, Cl. 112-277.000.
Tamura, Hiroshi; and Nakaie, Yutaka, to Kabushiki Kaisha Toshiba. Security monitoring systemcu4,694,282, Cl. 340-539.000.
Tamura, Hiroshi: *See*—
Higashi, Akio; Shinada, Haruji; Kawajiri, Kazuhiro; Ono, Yoshihiro; Saitou, Mitsuo; Tamura, Hiroshi; and Ikeda, Mitsuru, 4,694,317, Cl. 357-30.000.
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Tamura, Kouichi: *See*—
Kitagawa, Katsuichi; and Tamura, Kouichi, 4,693,608, Cl. 356-394.000.
Tamura, Sadahiro: *See*—
Inoue, Atsushi; Kuroda, Yuji; and Tamura, Sadahiro, 4,694,262, Cl. 331-96.000.
Tamura, Shinichiro; and Seto, Junetsu, to Sony Corporation. Photochromic photosensitive compositionscu4,693,962, Cl. 430-345.000.
Tan, Siv C.; Nguyen, Tri H.; and Benchimol, Claude D., to Thomson-CGR. Process of image reconstruction by tomodensitometry with improved spatial resolutioncu4,694,399, Cl. 364-414.000.
Tanahashi, Toshio: *See*—
Chujo, Yoshiki; Kayanuma, Nobuaki; Bessho, Hironori; Masui, Takatoshi; Nagai, Toshinari; Katsuno, Toshiyasu; and Tanahashi, Toshio, 4,693,076, Cl. 60-274.000.
Tanaka, Gotaro: *See*—
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Tanaka, Hidenori, to Victor Company of Japan, Ltd. Vertical synchronizing signal separating circuitcu4,694,340, Cl. 358-154.000.
Tanaka, Hiroshi; and Fukehara, Shinsuke, to Sony Corporation. Method and apparatus for printing trimming instructions for developer of photographscu4,694,354, Cl. 358-296.000.
Tanaka, Kazuna: *See*—
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Tanaka, Kenji: *See*—
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Tanaka, Kunio: *See*—
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Tanaka, Motoaki: *See*—
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Tanaka, Sumio; Saito, Shinji; Atsumi, Shigeru; and Ohtsuka, Nobuaki, to Kabushiki Kaisha Toshiba. Semiconductor memory devicecu4,694,429, Cl. 365-189.000.
Tanaka, Yasuhiro: *See*—
Kimura, Sakae; and Tanaka, Yasuhiro, 4,693,571, Cl. 350-634.000.
Tanaka, Yutaka; and Umemura, Shunji, to Sony Corporation. Color correction circuitcu4,694,330, Cl. 358-27.000.
Taneya, Mototaka: *See*—
Yano, Seiki; Yamamoto, Saburo; Matsui, Sadayoshi; and Taneya, Mototaka, 4,694,461, Cl. 372-50.000.
Tani, Hiroji: *See*—
Kasanami, Toru; Tani, Hiroji; Watanabe, Shizuharu; and Ikeda, Toshiaki, 4,693,843, Cl. 252-518.000.
Tani, Tadaaki: *See*—
Ihama, Mikio; and Tani, Tadaaki, 4,693,965, Cl. 430-569.000.
Taniguchi, Nobuyuki: *See*—
Yamaki, Toshio; Mukai, Hiromu; Fujino, Akihiko; Izumi, Shuji; Nakai, Masaaki; and Taniguchi, Nobuyuki, 4,693,581, Cl. 354-400.000.
Tanimoto, Fumio: *See*—
Inoue, Yoshiharu; Tanimoto, Fumio; and Kitano, Hisao, 4,693,844, Cl. 512-14.000.
Tanimoto, Junichi: *See*—
Hirano, Takaaki; Kamuro, Setsufumi; Yamaguchi, Akira; Tanimoto, Junichi; and Okada, Mikiro, 4,694,393, Cl. 364-200.000.
Tarakad, Ramanathan R.; and Crawford, Duffer B., to M. W. Kellogg Company, The. Removal of mercury from gasescu4,693,731, Cl. 55-72.000.
Tarman, Paul B.: *See*—
Lee, Bernard S.; Tarman, Paul B.; and Punwani, Dharam V., 4,693,682, Cl. 432-15.000.
Tashjian, Robert J.; and Moreland, Charles E., to New England Institute of Comparative Medicine. Transportable X-ray apparatuscu4,694,481, Cl. 378-198.000.
Tassi, Lamberto: *See*—
Ballestrazzi, Aris; and Tassi, Lamberto, 4,693,053, Cl. 53-389.000.
Tauzin, Francis, to Sigma Plastique; and Pomagalski S.A. Mechanism for opening, closing and locking two leaved doors for cable carscu4,693,033, Cl. 49-122.000.
Tavss, Edward A.; Santalucia, John; and Carroll, David L., to Colgate-Palmolive Company. Ethylene propylene copolymer in a substrate and collapsible dispensing container made therefromcu4,693,395, Cl. 222-107.000.
Tavss, Edward A.; Temin, Samuel; Santalucia, John; and Carroll, Davis L., to Colgate-Palmolive Company. Laminate substrate and article therefrom incorporating fluorinated polyethylenecu4,693,396, Cl. 222-107.000.
Taylor, Chandler R., Jr., to A. H. Robins Company, Incorporated. Method of treating depression with 5-(aminoalkyl)-11-phenyl-5H-dibenzo(b,e)(1,4) diazepinescu4,694,003, Cl. 514-220.000.
Taylor, Charles W.: *See*—
Krampe, Stephen E.; Moore, Cheryl L.; and Taylor, Charles W., 4,693,776, Cl. 156-327.000.
Taylor, Cynthia L.; and Nash, Judith E. M., to Community of Jesus, Inc. Wheelchair cover and method of using samecu4,693,289, Cl. 150-52.00R.

Taylor, Frank H., to Otis Engineering Corporation. Bleedoff tool for well test systemcu4,693,315, Cl. 166-336.000.

Taylor, William D.: *See*—
Miller, William H.; and Taylor, William D., 4,694,081, Cl. 544-385.000.
Miller, William H.; and Taylor, William D., 4,694,082, Cl. 544-385.000.

Tazaki, Satoru; Yoshioka, Yasuhiro; and Amazawa, Kiyoshi, to Clarion Co., Ltd. Control voltage generating circuit for activating a noise reduction circuit in an FM stereo receivercu4,694,500, Cl. 381-10.000.

Tchejeyan, Sarkis K.: *See*—
Kitzmann, Ronald A.; and Tchejeyan, Sarkis K., 4,694,130, Cl. 200-314.000.

TDK Corporation: *See*—
Nishimatsu, Masaharu; Arioka, Hiroyuki; and Ishizaki, Hideki, 4,693,934, Cl. 428-336.000.

Teac Corporation: *See*—
Tsuchiya, Isamu; Kawasaki, Tsutomu; and Sakai, Yoshiaki, 4,694,361, Cl. 360-97.000.

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Orlosky, Henry, 4,693,446, Cl. 249-53.00R.

Technicon Instruments Corporation: *See*—
Spadaro, Anthony M.; McLoughlin, Thomas J.; and Engler, Phillip V., 4,693,912, Cl. 427-213.300.

Techserve Engineering Corp.: *See*—
Brett, Dennis A.; and Runshe, Clay R., 4,693,786, Cl. 202-83.000.

Teichner, Robert W.: *See*—
Merrick, Stephen P.; and Teichner, Robert W., 4,694,183, Cl. 250-551.000.

Tektronix, Inc.: *See*—
Bergstedt, Gar A., 4,694,286, Cl. 340-703.000.
Mallory, Robert L.; Schamel, Alfred H.; and Sekel, Stephen M., 4,694,380, Cl. 361-424.000.
Matney, Earl G., 4,694,324, Cl. 358-10.000.
Pettet, Mark E.; and Hoeren, Gerd H., 4,694,420, Cl. 364-900.000.
Unger, Peter J.; and Mutton, Jon C., 4,694,379, Cl. 367-419.000.

Teledyne Industries, Inc.: *See*—
Lenz, Herman N.; and Chen, Allen G., 4,693,667, Cl. 415-115.000.

Telefunken Electronic GmbH: *See*—
Friedrich, Gerda; Rasch, Klaus-Dieter; and Schmidt, Wilfried, 4,694,117, Cl. 136-256.000.

Telefunken Fernseh und Rundfunk GmbH: *See*—
Keesen, Heinz-Werner; Oberjatzas, Gunter; and Peters, Hartmut, 4,694,336, Cl. 358-133.000.

TELSA, koncernovy podnik: *See*—
Jerabek, Jiri, 4,693,238, Cl. 128-1.500.

Temin, Samuel: *See*—
Tavss, Edward A.; Temin, Samuel; Santalucia, John; and Carroll, Davis L., 4,693,396, Cl. 222-107.000.

TEMSIR S.r.l.: *See*—
Bernocco, Giovanni, 4,693,488, Cl. 280-293.000.

Tenjinbayashi, Koji, to Agency of Industrial Science & Technology; and Ministry of International Trade and Industry. Interference method and interferometer for testing the surface precision of a parabolic mirrorcu4,693,604, Cl. 356-348.000.

Tensiter S.p.A.: *See*—
Chiaves, Carlo, 4,693,634, Cl. 405-126.000.

Terada, Yasushi; and Nakayama, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor devicecu4,694,314, Cl. 357-23.600.

Teramachi, Hiroshi. Simultaneously ground type bearing body and unlimited sliding bearing unit employing the samecu4,693,040, Cl. 51-291.000.

Teramachi, Hiroshi. Feeding apparatus employing ball screwcu4,693,131, Cl. 74-424.80B.

Terasaki, Masanori: *See*—
Ino, Toshio; Maenosono, Tsukasa; Yoshida, Kazuo; Terasaki, Masanori; Kuriwaki, Tetsusho; Koga, Tadao; and Hirado, Miharu, 4,694,131, Cl. 219-10.410.

Terhune, John J., to T. Entrepreneur, Inc. Garden toolcu4,693,022, Cl. 36-132.000.

Terra International, Inc.: *See*—
Haynes, Robert W., 4,693,609, Cl. 366-136.000.

Terrien, Conrad; and Carlson, Lee G., to UIP Engineered Products Corporation. Ion exchange apparatuscu4,693,818, Cl. 210-189.000.

Tescom Corporation: *See*—
Patterson, Daryll D., 4,693,267, Cl. 137-116.500.

Texas Instruments Incorporated: *See*—
Guttag, Karl M.; and McDonough, Kevin C., 4,694,391, Cl. 364-200.000.

Tezuka, Yasuyuki: *See*—
Imai, Kiyokazu; Shiomi, Tomoo; and Tezuka, Yasuyuki, 4,694,077, Cl. 536-92.000.

Thamm, Horst-Dieter: *See*—
Kleiner, Hans-Jerg; Kioss, Gerhard; Molter, Michael; Schwarz, Alexander; and Thamm, Horst-Dieter, 4,693,884, Cl. 424-1.100.

Theeuwes, Felix: *See*—
Wong, Patrick S. L.; and Theeuwes, Felix, 4,693,895, Cl. 424-473.000.

Thelen, Werner, to G. Siempelkamp GmbH & Co. Method of conveying particulate matscu4,693,860, Cl. 264-320.000.

Theodor Hymmen, Firma: *See*—
Pankoke, Werner, 4,693,177, Cl. 100-154.000.

Theodore Sweeney & Company, Inc.: *See*—
Sweeney, Theodore J., 4,693,652, Cl. 411-23.000.

Thermal Engine Technology, Inc.: *See*—
Lagow, Ralph J., 4,693,087, Cl. 60-670.000.

Thill, Bruce P.: *See*—
Fairchok, William J.; Friedrich, Ralph E.; Thill, Bruce P.; and McKinley, Mark J., 4,694,050, Cl. 525-411.000.

Thill, Gerald D., to Spearhead Industries, Inc. Egg decorating kitcu4,693,205, Cl. 118-13.000.

Thoma, Klemens; and Volker, Wolfgang, to Messer Griesheim GmbH. Device for generating dry, cold gas flowcu4,693,252, Cl. 128-400.000.

Thomas, James R.: *See*—
Moy, Howard; Thomas, James R.; and Droske, Donald J., 4,693,509, Cl. 296-201.000.

Thomas, Michael D.: *See*—
Williams, Glenn T.; and Thomas, Michael D., 4,693,444, Cl. 248-653.000.

Thomassen & Drijver-Verblifa NV: *See*—
Glerum, Johannes A.; and Klunder, Robert C., 4,693,658, Cl. 413-1.000.

Thompson, Edward D.: *See*—
Unrug, Konstanty F.; Thompson, Edward D.; and Nandy, Samir K., 4,693,638, Cl. 405-259.000.

Thomson-CGR: *See*—
Le Roux, Patrick, 4,694,253, Cl. 324-309.000.
Tan, Siv C.; Nguyen, Tri H.; and Benchimol, Claude D., 4,694,399, Cl. 364-414.000.

Thomson-CSF: *See*—
Blanchard, Pierre, 4,692,995, Cl. 437-41.000.
Chabbal, Jean J., 4,694,316, Cl. 357-24.000.
de Sartre, Jean, 4,694,386, Cl. 363-49.000.
Hetyei, Joseph, 4,694,200, Cl. 307-358.000.

Thomson-CSF Broadcast, Inc.: *See*—
Rahman, Altaf; and Navikas, Vincent J., 4,694,357, Cl. 360-9.100.

Thonnard, Norbert: *See*—
Payne, Marvin G.; Thonnard, Norbert; and Hurst, George S., 4,694,167, Cl. 250-282.000.

Thorn EMI plc: *See*—
Hing, Peter, 4,694,219, Cl. 313-636.000.

Thornton, David C.; and McKinley, Mark J., to Dow Chemical Company, The. Flocculants for brine-containing systemscu4,693,830, Cl. 210-734.000.

Thornton, Harold C., Jr.; and Hall, Clifton W., to Tramtec Corporation. Reversible self-adjusting propeller devicecu4,693,671, Cl. 416-43.000.

3 T S.p.A.: *See*—
Borromeo, Lucio, 4,693,627, Cl. 403-24.000.

Thurow, Eberhard: *See*—
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Tietze, Armin R.: *See*—
Rossi, Eva-Maria; and Tietze, Armin R., 4,693,908, Cl. 427-130.000.

Tighe, Charles L, Jr., to AMP Incorporated. Ribbon coax cable connectorcu4,693,539, Cl. 439-465.000.

Timmerman, Hendrik; and Van der Goot, Henderikus, to Akzo N.V. Quinazoline and isoquinoline derivativescu4,694,000, Cl. 514-187.000.

Timmermeister, Dieter M., to Tri-D-Automotive Industries, Ltd. Compact catalytic convertercu4,693,337, Cl. 181-231.000.

Titolo, Andrea, to Fiat Auto S.p.A. Tappet system for internal combustion engines having shafts with variable-profile camscu4,693,214, Cl. 123-90.180.

Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Hiroyuki, Furuhashi; Yamamoto, Tadashi; Imai, Masafumi; and Ueno, Hiroshi, 4,693,990, Cl. 502-116.000.

Toda, Shozo: *See*—
Hashimoto, Akira; Nishimura, Toshihiro; Nakayama, Muneo; Nakane, Hisashi; and Toda, Shozo, 4,694,040, Cl. 524-765.000.

Toganoh, Shigeo; Matsufuji, Yohji; and Ichihashi, Hiroo, to Canon Kabushiki Kaisha. Recording device with multiple recording units and a common ink sourcecu4,694,307, Cl. 346-140.00R.

Tojo, Yu: *See*—
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Tokai Rubber Industries, Ltd.: *See*—
Kanda, Ryouji, 4,693,456, Cl. 267-140.100.

Tokumo, Akio: *See*—
Suzuki, Shinichi; Tokumo, Akio; Kunugi, Yoshiro; and Kato, Masayuki, 4,694,498, Cl. 381-103.000.

Tokunaga, Yukio: *See*—
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Tokura, Norihito; Moritugu, Mitiyasu; and Kawai, Hisasi, to Nippon Soken, Inc. Device for measuring flow rate of aircu4,693,115, Cl. 73-204.000.

Tokyo Denshi Kagaku Kabushiki Kaisha: *See*—
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Tokyo Electric Co., Ltd.: *See*—
Ishii, Hidekazu; and Kosaka, Chihiro, 4,693,619, Cl. 400-212.000.
Kawaguchi, Katsuhiko, 4,693,621, Cl. 400-636.100.
Uchimura, Mitsuo; and Masuyama, Tsutomu, 4,693,330, Cl. 177-25.000.

Tokyo Juki Industrial Co., Ltd.: *See*—
Shindou, Norikazu, 4,694,209, Cl. 310-12.000.
Shiomi, Kengo; Sasaki, Yoshiyuki; and Kato, Toshiyuki, 4,694,305, Cl. 346-76.0PH.
Tami, Kazuya, 4,693,197, Cl. 112-277.000.
Yasui, Hideo, 4,693,192, Cl. 112-121.110.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Mizunoya, Nobuyuki; Kohama, Hajime; and Sugiura, Yasuyuki, 4,693,409, Cl. 228-122.000.

Tomalia, Donald A.; and Kirchhoff, Pamela M., to Dow Chemical Company, The. Rod-shaped dendrimercu4,694,064, Cl. 528-332.000.
Tomczak, Walter F.: *See*—
Black, Randy D.; and Tomczak, Walter F., 4,692,947, Cl. 2-421.000.
Tomii, Kaoru; and Hamada, Kiyoshi, to Matsushita Electric Industrial Co., Ltd. Method of driving a flat type of cathode ray tube to provide uniformity of electron beam emission characteristics for a plurality of beam sourcescu4,694,225, Cl. 315-366.000.
Tomisawa, Norio; Kamiya, Shingo; and Aoshima, Shinji, to Nippon Gakki Seizo Kabushiki Kaisha. Position control device for an optical reproduction system in an optical type disc reproduction devicecu4,694,441, Cl. 369-32.000.
Tomita, Takao; and Kawai, Noriaki, to Honda Giken Kogyo Kabushiki Kaisha. Noise reduction in gear transmissioncu4,693,133, Cl. 74-467.000.
Tomizawa, Fumio: *See*—
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Tomlonovic, Vincent J.: *See*—
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Tomy Kogyo Co., Inc.: *See*—
Seki, Yoshizo, 4,693,694, Cl. 446-197.000.
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Toray Industries, Inc.: *See*—
Kitagawa, Katsuichi; and Tamura, Kouichi, 4,693,608, Cl. 356-394.000.
Morimoto, Hiroshi; and Ohura, Akio, 4,694,086, Cl. 564-236.000.
Yoshioka, Toshio; Yoshikawa, Seiichi; and Shimamura, Masaharu, 4,693,828, Cl. 210-679.000.
Torikai, Eiichi, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Method for production of moisture sensitive elementcu4,693,953, Cl. 430-165.000.
Torizuka, Koichi; and Futaki, Kiyoshi, to Mitsubishi Paper Mills, Ltd. Negative type lithographic printing platecu4,693,955, Cl. 430-204.000.
Torok, Gabor P.; and White, Andrew B., to American Telephone and Telegraph Company; and Bell Telephone Laboratories, Incorporated. Clock adjustment method and apparatus for synchronous data communicationscu4,694,472, Cl. 375-107.000.
Tortella, Frank C.: *See*—
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Tosaka, Yoichi: *See*—
Otmuki, Ichiro; Aihara, Yoshihiko; Tosaka, Yoichi; and Eguchi, Masaharu, 4,693,574, Cl. 354-21.000.
Toshiba Ceramics, Ltd.: *See*—
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Toshiba Kikai Kabushiki Kaisha: *See*—
Yamamoto, Harutoshi; and Sakomoto, Sadasue, 4,693,293, Cl. 164-99.000.
Toshikuni, Masami; Suzuki, Kazunori; and Yoshida, Norie, to JGC Corporation. Method of treating radioactive waste water resulting from decontaminationcu4,693,833, Cl. 210-759.000.
Toth, Vincent A.: *See*—
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Toto Ltd.: *See*—
Taki, Masaru; Okada, Hiroshi; Kawamura, Seijiro; Kusumoto, Akio; Morita, Koji; Ikenaga, Takao; Shigematsu, Toshifumi; and Iida, Masami, 4,692,951, Cl. 4-664.000.
Tourret, Alain P., to Aciers et Outillage Peugeot. Winding mandrel especially for a safety strapcu4,693,432, Cl. 242-74.000.
Tower, Stephen N.; Braun, Howard E.; Boyle, David E.; and Salton, Robert B., to Westinghouse Electric Corp. Gas displacement spectral shift reactor and control methodcu4,693,862, Cl. 376-209.000.
Toyama, Masamichi; and Kozuki, Susumu, to Canon Kabushiki Kaisha. Focus adjusting devicecu4,694,149, Cl. 250-201.000.
Toyama, Minoru: *See*—
Ichikawa, Hiroyuki; and Toyama, Minoru, 4,693,565, Cl. 350-413.000.
Toyo Boseki Kabushiki Kaisha: *See*—
Kuze, Katsuaki; Nishino, Yasuhiro; Matsuyama, Yujiro; Maeda, Kozo; Kobayashi, Masahiro; Okudaira, Tadashi; Hongo, Tsuyoshi; and Makimura, Osamu, 4,693,932, Cl. 428-323.000.
Toyo Boseki Kabushiki Kaisha T/A Toyobo Co., Ltd.: *See*—
Morita, Ichiro; Taika, Tadao; and Nakamura, Hidehiro, 4,694,049, Cl. 525-440.000.
Toyo Denki Seizo Kabushiki Kaisha and Komatsu Ltd.: *See*—
Takei, Hidetoshi; and Minami, Teruo, 4,694,125, Cl. 191-87.000.
Toyo Jozo Kabushiki Kaisha: *See*—
Misaki, Hideo, 4,693,971, Cl. 435-17.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Seita, Toru; Satoh, Takao; and Kikuchi, Mitsuo, 4,693,796, Cl. 204-98.000.
Toyoda Gosei Co., Ltd.: *See*—
Ukai, Mikio; and Okumoto, Ryouji, 4,693,484, Cl. 277-212.0FB.
Toyoda Koki Kabushiki Kaisha: *See*—
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Toyota Central Research & Development Laboratories, Inc.: *See*—
Ikemoto, Hiroyuki; Oowa, Nobutaka; Hayashi, Yasutaka; and Doi, Shunichi, 4,693,493, Cl. 280-707.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Buma, Shuuichi; Onuma, Toshio; Ohashi, Kaoru; and Itou, Masami, 4,693,494, Cl. 280-707.000.
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Harada, Yoshiharu; Taga, Yutaka; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, 4,693,143, Cl. 74-866.000.
Hayakawa, Toshihiro, 4,693,416, Cl. 98-2.090.
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Kobayashi, Koji; Sumiya, Koji; Taga, Yutaka; and Watanabe, Kazuaki, 4,693,353, Cl. 192-85.0AA.
Miyata, Hiroshi; and Katoh, Shinji, 4,693,332, Cl. 180-142.000.
Nakamura, Shinya; Kubo, Seitoku; and Taga, Yutaka, 4,693,081, Cl. 60-448.000.
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Takeshita, Hajime; Iwase, Takahiro; Masuda, Naofumi; Sibata, Takuo; Mochizuki, Hiroyuki; Kobayashi, Nobuo; Kawakami, Seiho; and Kuroiwa, Yosio, 4,693,813, Cl. 409-244.000.
Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Maeda, Koji; Watanabe, Kazuaki; and Taga, Yutaka, 4,693,348, Cl. 192-3.290.
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Toyota Jidosha Kabushikikaisha: *See*—
Umeyama, Mitsuhiro; Wakahara, Kaoru; Ohtani, Kisao; Kametaka, Kenichi; Kinoshita, Masaru; and Kobayashi, Nobuyuki, 4,693,354, Cl. 192-106.100.
Traczyk, Edward S.; and Shulski, Michael M., to National Can Corporation. Method and apparatus for necking and flanging containercu4,693,108, Cl. 72-370.000.
Traffic Transport Engineering, Inc.: *See*—
Stuart, Gerald W., 4,693,651, Cl. 410-30.000.
Tramtec Corporation: *See*—
Thornton, Harold C., Jr.; and Hall, Clifton W., 4,693,671, Cl. 416-43.000.
Transfield, Inc.: *See*—
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Tri-D-Automotive Industries, Ltd.: *See*—
Timmermeister, Dieter M., 4,693,337, Cl. 181-231.000.
Tricini, John D., to Valve Systems, Inc. Valve structurescu4,693,451, Cl. 251-163.000.
Trinh, Toan; and Scheper, John S., to Procter & Gamble Company, The. No rinse liquid car cleaner with solid polymerscu4,693,840, Cl. 252-174.230.
Tripar Incorporated: *See*—
Breckwoldt, Robert G., 4,693,266, Cl. 131-359.000.
Triten Corporation: *See*—
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Trofast, Jan W.: *See*—
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Trouw, Norman S., to Celanese Corporation. Method for the preparation of polybenzimidazole membranescu4,693,825, Cl. 210-500.280.
Trube, Hans: *See*—
Arold, Klaus; Koukal, Heinz; Grimm, Hermann, deceased; and Trube, Hans, 4,693,417, Cl. 237-12.30B.
Trumper, Reinhard; and Baschant, Robert, to O & K Orenstein & Koppel AG. Connecting elevatorcu4,693,661, Cl. 414-595.000.
Trush, David M.: *See*—
LaRocca, William J.; and Trush, David M., 4,693,135, Cl. 74-473.00R.
Trutek Research, Inc.: *See*—
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TRW Inc.: *See*—
Rezek, Edward A.; and Burghard, Andre, 4,694,311, Cl. 357-17.000.
Trznadel, Amalia. Elastic bandage knee supportcu4,693,241, Cl. 128-157.000.
Tsang, Won-Tien: *See*—
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Tsay, Grace C.: *See*—
Collins, Michael S.; Tsay, Grace C.; and Seng, Richard L., 4,693,891, Cl. 424-92.000.
Tsinberg, Mikhail, to North American Philips Corporation. High-definition television transmission systemcu4,694,338, Cl. 358-141.000.
Tsuchiya, Isamu; Kawasaki, Tsutomu; and Sakai, Yoshiaki, to Teac Corporation. Data transfer apparatus having a simplified clamp mechanism for holding a disklike record medium in placecu4,694,361, Cl. 360-97.000.
Tsuchiya, Tatsuo; and Hozumi, Kazuhiro, to Matsushita Electric Industrial Co., Ltd.; and Kuroda Precision Industries Ltd. Air pressure shock absorbercu4,693,454, Cl. 267-226.000.
Tsuchiya, Yutaka; Koishi, Musubu; and Takeshima, Akira, to Hamamatsu Photonics Kabushiki Kaisha. Instruments for measuring light pulses clocked at high repetition rate and electron tube devices thereforcu4,694,154, Cl. 250-213.0VT.
Tsuda, Hiroshi: *See*—
Kasai, Junichi; Imai, Hiroshi; and Tsuda, Hiroshi, 4,694,497, Cl. 381-63.000.

Tsuetaki, George F.; and Sato, Shiro, to Fused Kontacts of Chicago, Inc. Monocentric bifocal corneal contact lenscu4,693,572, Cl. 351-161.000.

Tsujimoto, Jun-ichi: *See*—
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Tsujimura, Osamu; Saito, Takayoshi; and Arai, Tatsuo, to Mitsubishi Kinzoku Kabushiki Kaisha. End mill with throw-away tipcu4,693,641, Cl. 407-42.000.

Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Maeda, Koji; Watanabe, Kazuaki; and Taga, Yutaka, to Aisin Warner Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Direct coupling clutch with an integral damper device for a fluid couplingcu4,693,348, Cl. 192-3.290.

Tsunoda, Kouichi: *See*—
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Tsunoi, Haruo, to Canon Kabushiki Kaisha. Device for recording information on a photosensitive medium for electrophotographycu4,693,548, Cl. 350-96.130.

Tucel Industries Inc.: *See*—
Lewis, John C., Jr., 4,693,519, Cl. 300-7.000.

Tucker, Daniel M. Chlorine generator devicecu4,693,806, Cl. 204-252.000.

Tunstromer, Nils, to Stubinen Utveckling AB. Apparatus for and method of burning and/or thermally decomposing fuel, especially solid fuelscu4,693,234, Cl. 126-155.000.

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Wehle, Anton; Unrath, Dieter; and Zimmermann, Gunther, to Stihl, Andreas. Guide bar for a saw chain of a motor-driven chain sawcu4,693,005, Cl. 30-383.000.

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Weithmann, Klaus U.; and Seiffge, Dirk, to Hoechst Aktiengesellschaft. Combination product composed of pyrimido-pyrimidines and O-acetylsalicylic acid or its pharmacologically tolerated salts, and its usecu4,694,024, Cl. 514-161.000.
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Kasner, William H.; Bruck, Gerald J.; Miller, Richard A.; and Toth, Vincent A., 4,694,136, Cl. 219-121.0LD.
Kuznetsov, Stephen B.; and Nathenson, Richard D., 4,693,299, Cl. 164-502.000.
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Hayakawa, Toshiro; Suyama, Takahiro; Takahashi, Kohsei; and Yamamoto, Saburo, 4,693,207, Cl. 118-715.000.
Hayakawa, Toshiro; Suyama, Takahiro; and Yamamoto, Saburo, 4,694,460, Cl. 372-45.000.
Yano, Seiki; Yamamoto, Saburo; Matsui, Sadayoshi; and Taneya, Mototaka, 4,694,461, Cl. 372-50.000.

Yamamoto, Shigeru; and Akiba, Masaru, to Daiwa Seiko Inc. Fishing rodcu4,693,029, Cl. 43-22.000.

Yamamoto, Tadashi: *See*—
Hiroyuki, Furuhashi; Yamamoto, Tadashi; Imai, Masafumi; and Ueno, Hiroshi, 4,693,990, Cl. 502-116.000.

Yamamoto, Takashi: *See*—
Sasaki, Isao; Nishida, Kozi; Morimoto, Masaru; and Yamamoto, Takashi, 4,693,553, Cl. 350-96.340.

Yamamoto, Yoshinori: *See*—
Ohyama, Masao; Yamamoto, Yoshinori; Horikawa, Kenichi; and Kawakami, Kenji, 4,694,360, Cl. 360-96.500.

Yamamuro, Akira: *See*—
Fujikura, Yoshiaki; Yamamuro, Akira; and Nakajima, Motoki, 4,693,845, Cl. 512-9.000.

Yamanaka, Mitsuyuki: *See*—
Hayashi, Yutaka; Mishuku, Toshio; Yamanaka, Mitsuyuki; and Iida, Hideyo, 4,694,116, Cl. 136-256.000.

Yamaoka, Hiromasa: *See*—
Okamoto, Tadashi; Shimoyama, Kazuhiko; Yamaoka, Hiromasa; and Takakura, Mitsuro, 4,694,419, Cl. 364-900.000.

Yamasaki, Tetsuya; and Okuda, Eiji, to Nippon Sheet Glass Co., Ltd. Optical branching device with internal waveguidecu4,693,544, Cl. 350-96.160.

Yamashita, Shigeki: *See*—
Morino, Tetsuro; and Yamashita, Shigeki, 4,694,303, Cl. 346-1.100.

Yamauchi, Noriaki; Ikeou, Shinnei; and Imada, Kunihiko, to Sumitomo Chemical Company, Limited. Aqueous liquid dye composition containing bifunctional reactive dye having both monohalogenotriazinyl and vinyl sulfonyl fiber reactive groupscu4,693,725, Cl. 8-527.000.
Yamazaki, Hiroshi: *See*—
Ogihara, Masuo; Oda, Hajime; Seki, Yoichi; and Yamazaki, Hiroshi, 4,693,583, Cl. 354-439.000.
Yamazaki, Hozo: *See*—
Yoshimura, Shushichi; Hiwatashi, Yasunori; Kobayashi, Hiromu; Yamazaki, Hozo; Nishino, Nobu; Tahara, Teruji; and Kobayashi, Hidenobu, 4,693,879, Cl. 423-461.000.
Yamazaki, Seiichi; Uchiyama, Kaoru; and Tahara, Toshiro, to Fuji Photo Film Co., Ltd. Drying apparatuscu4,693,016, Cl. 34-52.000.
Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Non-single-crystal semiconductor light emitting devicecu4,694,312, Cl. 357-17.000.
Yanagihara, Kenji; Kimura, Mituo; Niinomi, Masahiro; Nishikawa, Yasuo; and Mukaida, Yoshito, to Japan Synthetic Rubber Co., Ltd.; and Fuji Photo Film Co., Ltd. Process for producing plasma polymerized filmcu4,693,799, Cl. 204-165.000.
Yanagihara, Kenji: *See*—
Nishikawa, Yasuo; Okita, Tsutomu; Mukaida, Yoshito; Yanagihara, Kenji; Kimura, Mituo; and Niinomi, Masahiro, 4,693,927, Cl. 428-216.000.
Yanagimoto, Takekazu: *See*—
Arai, Noboru; and Yanagimoto, Takekazu, 4,693,555, Cl. 350-253.000.
Yanagisawa, Ichiro: *See*—
Kobayashi, Shigeyoshi; Manabe, Tsuneo; and Yanagisawa, Ichiro, 4,693,748, Cl. 106-35.000.
Yanai, Eiji; and Kuribayashi, Tetsuzo, to Hitachi, Ltd. Waste heat recovery boilercu4,693,213, Cl. 122-7.00R.
Yanmar Diesel Engine Co., Ltd.: *See*—
Nagakura, Katsuhiko, 4,693,218, Cl. 123-260.000.
Yano, Koji: *See*—
Hoshikawa, Masao; Kyoto, Michihisa; Yano, Koji; and Tanaka, Gotaro, 4,693,738, Cl. 65-3.110.
Yano, Seiki; Yamamoto, Saburo; Matsui, Sadayoshi; and Taneya, Mototaka, to Sharp Kabushiki Kaisha. Semiconductor laser arraycu4,694,461, Cl. 372-50.000.
Yarbrough, Joseph A.; Kingsland, David O.; and Pease, Donald L., to Xerox Corporation. Thermal air curtain for a copying/printing machinecu4,693,588, Cl. 355-3.00R.
Yardy, Raymond: *See*—
Cohen, Donald K.; and Yardy, Raymond, 4,694,447, Cl. 369-110.000.
Yasuga, Masaki. Tile-cutting machinecu4,693,232, Cl. 125-23.00T.
Yasui, Hideo, to Tokyo Juki Industrial Co., Ltd. Control device for sewing machinecu4,693,192, Cl. 112-121.110.
Yau, Yuk M., to Conair Corporation. Generator for hair styling mousecu4,693,854, Cl. 261-84.000.
Yeaman Packaging Group, Inc.: *See*—
Yeaman, William E., Sr., 4,693,412, Cl. 229-40.000.
Yeaman, William E., Sr., to Yeaman Packaging Group, Inc. Sleeve package having locking tabs for holding multiple aceptic cartoncu4,693,412, Cl. 229-40.000.
Yeh, An-I: *See*—
Berg, Lloyd; and Yeh, An-I, 4,693,789, Cl. 203-51.000.
Yissum Research Development Company of the Hebrew University of Jerusalem: *See*—
Shilo, Moshe; and Fattom, Ali, 4,693,842, Cl. 252-356.000.
Yokogawa Electric Corporation: *See*—
Iwaoka, Hideto; Sugiyama, Tadashi; Matsuura, Hiroyuki; and Hirata, Takaaki, 4,694,250, Cl. 324-309.000.
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Yoshitome, Eiji; and Hoshino, Kazuya, 4,694,251, Cl. 324-309.000.
Yokokura, Hisao: *See*—
Hirai, Yoichi; Fujii, Tsunenori; Koto, Kaoru; Suzuki, Kenji; Yoshida, Masahiro; Okawa, Hisashi; Okabe, Yoshiaki; Kitamura, Teruo; Yokokura, Hisao; Hattori, Shintaroo; Mukoh, Akio; and Sato, Mikio, 4,694,098, Cl. 560-59.000.
Yokoyama, Eiji: *See*—
Ohyauchi, Hideo; Amano, Yoshiaki; and Yokoyama, Eiji, 4,693,945, Cl. 429-21.000.
Yoneda, Hitoshi: *See*—
Saito, Tutomu; and Yoneda, Hitoshi, 4,694,310, Cl. 346-153.100.
Yoneda, Takao; and Nakano, Hiroshi, to Toyoda Koki Kabushiki Kaisha. Numerical control apparatus for machinecu4,694,233, Cl. 318-569.000.
Yoneyama, Takashi: *See*—
Ryoke, Katsumi; Takahashi, Masatoshi; Yoneyama, Takashi; Nishikawa, Yasuo; and Tadokoro, Eiichi, 4,693,929, Cl. 428-323.000.
Yoon, Hyun-Nam: *See*—
DeMartino, Ronald N.; Yoon, Hyun-Nam; Stamatoff, James B.; and Buckley, Alan, 4,694,066, Cl. 528-373.000.
Yoshida, Kazuo: *See*—
Ino, Toshio; Maenosono, Tsukasa; Yoshida, Kazuo; Terasaki, Masanori; Kuriwaki, Tetsuaho; Koga, Tadao; and Hirado, Miharu, 4,694,131, Cl. 219-10.410.
Yoshida, Masahiro: *See*—
Hirai, Yoichi; Fujii, Tsunenori; Koto, Kaoru; Suzuki, Kenji; Yoshida, Masahiro; Okawa, Hisashi; Okabe, Yoshiaki; Kitamura, Teruo; Yokokura, Hisao; Hattori, Shintaroo; Mukoh, Akio; and Sato, Mikio, 4,694,098, Cl. 560-59.000.
Yoshida, Norie: *See*—
Toshikuni, Masami; Suzuki, Kazunori; and Yoshida, Norie, 4,693,833, Cl. 210-759.000.
Yoshikawa, Seiichi: *See*—
Yoshioka, Toshio; Yoshikawa, Seiichi; and Shimamura, Masaharu, 4,693,828, Cl. 210-679.000.
Yoshimura, Hirofumi, to Kabushiki Kaisha Cosina. Autofocusing zoom lens system with beam splitter prism for single lens reflex camerascu4,694,151, Cl. 250-201.000.
Yoshimura, Shushichi; Hiwatashi, Yasunori; Kobayashi, Hiromu; Yamazaki, Hozo; Nishino, Nobu; Tahara, Teruji; and Kobayashi, Hidenobu, to Mitsubishi Chemical Industries Ltd. Ultrasonic vibration sieving apparatus and process for purifying carbon black by using the apparatuscu4,693,879, Cl. 423-461.000.
Yoshinaga, Sadao: *See*—
Katsuda, Yoshio; Yoshinaga, Sadao; and Mashine, Hiroyoshi, 4,693,868, Cl. 422-124.000.
Yoshioka, Toshio; Yoshikawa, Seiichi; and Shimamura, Masaharu, to Toray Industries, Inc. Method of ion-exchanging and/or adsorptioncu4,693,828, Cl. 210-679.000.
Yoshioka, Yasuhiro: *See*—
Tazaki, Satoru; Yoshioka, Yasuhiro; and Amazawa, Kiyoshi, 4,694,500, Cl. 381-10.000.
Yoshitome, Eiji; and Hoshino, Kazuya, to Yokogawa Medical Systems, Limited. Method and apparatus for nuclear magnetic resonance imagingcu4,694,251, Cl. 324-309.000.
Yoshizaki, Kiyoshi: *See*—
Kawamura, Toshimi; Yamada, Tadatoshi; Hani, Kiyoshi; and Yoshizaki, Kiyoshi, 4,694,268, Cl. 335-216.000.
Yoshizawa, Keiichi, to Seikosha Co., Ltd. Alarm mechanismcu4,693,612, Cl. 368-74.000.
Young, Rocky M.; and Vo, Tri T., to NCR Corporation. System for performing virtual look-ahead memory operationscu4,694,395, Cl. 364-200.000.
Young, Vernon V., to International Minerals & Chemical Corp. Bacitracin-metal-polyether antibiotic complexescu4,693,992, Cl. 514-11.000.
Yutaka Yamada: *See*—
Yamada, Yutaka, 4,693,269, Cl. 137-512.100.
Yuter, Seymour C. Combined telephone-table systemcu4,694,480, Cl. 379-110.000.
Zahir, Abdul-Cader: *See*—
Lehmann, Hans; and Zahir, Abdul-Cader, 4,694,096, Cl. 558-251.000.
Zakary, Paul D.: *See*—
Stillie, Donald G.; and Zakary, Paul D., 4,693,530, Cl. 439-67.000.
Zakharin, Greg: *See*—
Blackford, William L.; and Zakharin, Greg, 4,693,732, Cl. 55-112.000.
Zaleski, James V. Apparatus for testing auto electronics systemscu4,694,408, Cl. 364-551.000.
Zettlemoyer, Albert C.: *See*—
Schwartz, Anthony M.; Kawashima, Norimichi; and Zettlemoyer, Albert C., 4,693,958, Cl. 430-302.000.
Ziegler, Walter; Dietsche, Wolfram; Weiss, Stefan; Mueller, Richard; Hettche, Albert; Glaser, Klaus; and Vamvakaris, Christos, to BASF Aktiengesellschaft. Aqueous wax dispersions as preservatives for metal surfaces and surfaces of coatings, their use and a process for preserving metal surfaces and surfaces of coatingscu4,693,909, Cl. 427-156.000.
Zieren, Victor: *See*—
Kordi, Srdjan; Zieren, Victor; and Middelhoek, Simon, 4,694,248, Cl. 324-252.000.
Zimmermann, Gunther: *See*—
Wehle, Anton; Unrath, Dieter; and Zimmermann, Gunther, 4,693,005, Cl. 30-383.000.
Zimpro Inc.: *See*—
Garzonetti, Gary A., 4,693,831, Cl. 210-744.000.
Mordorski, Carol J., 4,693,827, Cl. 210-614.000.
Zlehit pri Ban: *See*—
Moshtev, Rafail V.; Manev, Vesselin G.; and Puresheva, Bogdana L., 4,693,950, Cl. 429-194.000.
Zondler, Helmut: *See*—
Hubele, Adolf; Zondler, Helmut; Riebli, Peter; and Eckhardt, Wolfgang, 4,694,009, Cl. 514-269.000.
Zortea, Michel: *See*—
Noiret, Robert; and Zortea, Michel, 4,693,740, Cl. 65-135.000.
Zoueki, Georges. Universal frame centering, holding and measuring devicecu4,693,573, Cl. 351-204.000.
Zygo Corporation: *See*—
Sommargren, Gary E., 4,693,605, Cl. 356-349.000.
5W Enterprises, Inc.: *See*—
Guthrie, Gerald, 4,693,656, Cl. 411-433.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF SEPTEMBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Akzona Incorporated: *See*—
Steenken, Gerhard, Re. 32,503, Cl. 423-339.000.
AMP Incorporated: *See*—
Kumar, Vijay, Re. 32,502, Cl. 439-92.000.
Hensley, George H.; and Hensley, Raymond E. Combustion initiation systemcuRe. 32,505, Cl. 361-257.000.
Hensley, Raymond E.: *See*—
Hensley, George H.; and Hensley, Raymond E., Re. 32,505, Cl. 361-257.000.
Kumar, Vijay, to AMP Incorporated. Grounding mating hardwarecuRe. 32,502, Cl. 439-92.000.
Michel, Ulrich; and Radecker, Josef, to Wacker-Chemie GmbH. Room temperature stable organopolysiloxane compositionscuRe. 32,504, Cl. 528-15.000.
Okada Kogyo Kabushiki Kaisha: *See*—
Okada, Yoshio, Re. 32,501, Cl. 30-292.000.
Okada, Yoshio, to Okada Kogyo Kabushiki Kaisha. Rotary cuttercuRe. 32,501, Cl. 30-292.000.
Radecker, Josef: *See*—
Michel, Ulrich; and Radecker, Josef, Re. 32,504, Cl. 528-15.000.
Scovill Japan Kabushiki Kaisha: *See*—
Takata, Akihiko, Re. 32,500, Cl. 24-113.0MP.
Steenken, Gerhard, to Akzona Incorporated. Silicic acid for the filtration of beverages particularly beercuRe. 32,503, Cl. 423-339.000.
Takata, Akihiko, to Scovill Japan Kabushiki Kaisha. Button having plastic resin headcuRe. 32,500, Cl. 24-113.0MP.
Wacker-Chemie GmbH: *See*—
Michel, Ulrich; and Radecker, Josef, Re. 32,504, Cl. 528-15.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Adee, James M.; and MacPherson, John A., to Form Physics Corp. Process for forming metal parts with less than 1 percent carbon contentcuB1 4,225,345, 9-15-87, Cl. 419-36.000.
Bayer Aktiengesellschaft: *See*—
Grohe, Klaus; Petersen, Uwe; Zeiler, Hans-Joachim; and Metzger, Karl G., B1 4,556,658, Cl. 514-254.000.
Form Physics Corp.: *See*—
Adee, James M.; and MacPherson, John A., B1 4,225,345, Cl. 419-36.000.
Grohe, Klaus; Petersen, Uwe; Zeiler, Hans-Joachim; and Metzger, Karl G., to Bayer Aktiengesellschaft. 7-amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-4-oxo-quinoline-3-carboxylic acids and antibacterial agents containing these compoundscuB1 4,556,658, 9-15-87, Cl. 514-254.000.
Hamilton, James C. Shoe repair devicecuB1 4,166,328, 9-15-87, Cl. 36-72.00R.
MacPherson, John A.: *See*—
Adee, James M.; and MacPherson, John A., B1 4,225,345, Cl. 419-36.000.
Metzger, Karl G.: *See*—
Grohe, Klaus; Petersen, Uwe; Zeiler, Hans-Joachim; and Metzger, Karl G., B1 4,556,658, Cl. 514-254.000.
Petersen, Uwe: *See*—
Grohe, Klaus; Petersen, Uwe; Zeiler, Hans-Joachim; and Metzger, Karl G., B1 4,556,658, Cl. 514-254.000.
Zeiler, Hans-Joachim: *See*—
Grohe, Klaus; Petersen, Uwe; Zeiler, Hans-Joachim; and Metzger, Karl G., B1 4,556,658, Cl. 514-254.000.

LIST OF DESIGN PATENTEES

AAR Brooks & Perkins Corp.: *See*—
Knowlton, Christopher M.; and O'Hara, Robert J., 291,932, Cl. D32-4.000.
All-Steel Canada Ltd.: *See*—
Worrell, William R.; and Laroche, Robert N., 291,853, Cl. D6-511.000.
American Commercial Inc.: *See*—
Everhan, Walter, 291,856, Cl. D7-30.000.
American Standard Inc.: *See*—
Fabian, Wolfgang, 291,912, Cl. D23-35.000.
Associated Images, Inc.: *See*—
Clifford, James W.; and Eaton, Rodney I., 291,891, Cl. D16-14.000.
B e B S.r.l.: *See*—
Bertani, Carlo, 291,934, Cl. D32-70.000.
Baker, John F.; and Dep, Barry, to Baker, John F. Portable cooler for allergenic extractscu291,858, 9-15-87, Cl. D7-77.000.
Baumgardner, Edward W. Protective transport container for sports equipmentcu291,842, 9-15-87, Cl. D3-36.000.
Beecham Group p.l.c.: *See*—
Hindle, Brian R., 291,868, Cl. D9-453.000.
Bennett, Charles. Coin bank or the likecu291,939, 9-15-87, Cl. D99-40.000.
Bergdahl, Knut E. Channel body for an air supply registercu291,914, 9-15-87, Cl. D23-112.000.
Berger, Barry D., to Timex Corporation. Packaging container for a wristwatchcu291,867, 9-15-87, Cl. D9-430.000.
Bertani, Carlo, to B e B S.r.l. Ironcu291,934, 9-15-87, Cl. D32-70.000.
Blaisdell, Ronald G.; and Gagnon, Peter R., to GTE Products Corporation. Lampcu291,921, 9-15-87, Cl. D26-2.000.
Boyle, William F.; and Chandler, Maurice P., to General Motors Corporation. Wheel covercu291,879, 9-15-87, Cl. D12-209.000.
Brachear, Howard. Fishing jugcu291,905, 9-15-87, Cl. D22-146.000.
Brice Ilotan Research Corporation: *See*—
Brice, Michael F., 291,866, Cl. D9-337.000.
Brice, Michael F., to Brice Ilotan Research Corporation. Combined packaging container and brewing device for coffee or the likecu291,866, 9-15-87, Cl. D9-337.000.
Bridgestone Corporation: *See*—
Hayakawa, Toshio; and Ohkuni, Shinichiro, 291,874, Cl. D12-147.000.
Hayakawa, Toshio; and Osawa, Toru, 291,875, Cl. D12-147.000.
Hayakawa, Toshio; Himuro, Yasuo; and Osawa, Toru, 291,876, Cl. D12-149.000.
Nishio, Hideaki; and Takase, Kiyoshi, 291,877, Cl. D12-151.000.
Broadbent, Michael C.: *See*—
Tucker, Roger; Gillam, Paul A.; Wright, Peter; Whitehouse, Donald; Broadbent, Michael C.; and Moran, Charles, 291,913, Cl. D23-97.000.
Bulgari, Gianni, to Partecipazioni Bulgari S.p.A. Combined watch and braceletcu291,869, 9-15-87, Cl. D10-32.000.
Bunn-O-Matic Corporation: *See*—
Stover, Kenneth W., 291,896, Cl. D20-5.000.
Cadman, Christian B. Cup and saucer standcu291,848, 9-15-87, Cl. D6-466.000.
Cameron, Lonny R. Novelty cap or similar articlecu291,840, 9-15-87, Cl. D2-248.000.
Carr, Donald W.; and Serbinski, Andrew T., to Savin Corporation. Copying machinecu291,892, 9-15-87, Cl. D16-30.000.

Carville, Michele A., to Kraft, Inc. Bottlecu291,865, 9-15-87, Cl. D9-322.000.
Chandler, Maurice P.: *See*—
Boyle, William F.; and Chandler, Maurice P., 291,879, Cl. D12-209.000.
Chapman, Doug. Aerial toycu291,901, 9-15-87, Cl. D21-86.000.
Clifford, James W.; and Eaton, Rodney I., to Associated Images, Inc. Projection enclosurecu291,891, 9-15-87, Cl. D16-14.000.
Condon, Richard W.: *See*—
Urbanski, Sigmund S.; Condon, Richard W.; and Stanuch, Edward S., 291,870, Cl. D10-114.000.
Conn, Marks M., to Mallin Company. Frame for a swivel rockercu291,846, 9-15-87, Cl. D6-344.000.
Conn, Marks M., to Mallin Company. Table or the likecu291,852, 9-15-87, Cl. D6-487.000.
Cook, Gregory D., to Cook Manufacturing Corporation. Detachable passenger compartment for a golf cartcu291,878, 9-15-87, Cl. D12-156.000.
Cook Manufacturing Corporation: *See*—
Cook, Gregory D., 291,878, Cl. D12-156.000.
Cooper Industries: *See*—
Dacanay, Romeo A., 291,925, Cl. D26-61.000.
Cooper Industries, Inc.: *See*—
Kusmer, Raymond J., 291,929, Cl. D26-138.000.
Cowart, Betty J.: *See*—
Kilman, Brenda J.; and Cowart, Betty J., 291,930, Cl. D28-59.000.
Dacanay, Romeo A., to Cooper Industries. Framing projector for track lighting systemcu291,925, 9-15-87, Cl. D26-61.000.
Danley, Allen M.: *See*—
Pomroy, James F.; and Danley, Allen M., 291,854, Cl. D7-402.000.
Danro Engineering (Proprietary) Limited: *See*—
Wallace, Robert; and Miskowic, Dragan, 291,860, Cl. D7-360.000.
Datakey, Inc.: *See*—
Flies, William P., 291,897, Cl. D20-22.000.
Davis, James R. Combined mobile imaging and scanning machine for radiation detectioncu291,915, 9-15-87, Cl. D24-2.000.
Davis, James R. Combined mobile imaging and scanning machine for radiation detectioncu291,916, 9-15-87, Cl. D24-2.000.
Dep, Barry: *See*—
Baker, John F.; and Dep, Barry, 291,858, Cl. D7-77.000.
Dictaphone Corporation: *See*—
Hoover, John W.; Rutkowski, Richard G.; and Luppino, Rocco, 291,882, Cl. D14-3.000.
Diebold Incorporated: *See*—
Long, Douglas G., 291,936, Cl. D99-28.000.
Eaton, Rodney I.: *See*—
Clifford, James W.; and Eaton, Rodney I., 291,891, Cl. D16-14.000.
Erbach, Arthur R.; and Stephen, James C., to Weber-Stephen Products Co. Wire cooking rackcu291,855, 9-15-87, Cl. D7-404.000.
Everhan, Walter, to American Commercial Inc. Dinner platecu291,856, 9-15-87, Cl. D7-30.000.
Fabian, Wolfgang, to American Standard Inc. Combined hand shower, adjustable holder and article holdercu291,912, 9-15-87, Cl. D23-35.000.
Federal Signal Corporation: *See*—
Urbanski, Sigmund S.; Condon, Richard W.; and Stanuch, Edward S., 291,870, Cl. D10-114.000.
Fisher, Kenneth G. Mail boxcu291,937, 9-15-87, Cl. D99-30.000.
Flies, William P., to Datakey, Inc. Identification tagcu291,897, 9-15-87, Cl. D20-22.000.
Fong, Peter; and Henry, Tsang H. T., to Tradebest International Corporation. Transmitter or similar articlecu291,888, 9-15-87, Cl. D14-95.000.
Fries, Hjalmar, to ITT Industries, Inc. Submersible unit for mixing and aeration of industrial effluent or the likecu291,911, 9-15-87, Cl. D23-1.000.
Gagnon, Peter R.: *See*—
Blaisdell, Ronald G.; and Gagnon, Peter R., 291,921, Cl. D26-2.000.
General Motors Corporation: *See*—
Boyle, William F.; and Chandler, Maurice P., 291,879, Cl. D12-209.000.
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George, Elmer. Hand batcu291,907, 9-15-87, Cl. D21-213.000.
Gerver, Howard: *See*—
Gerver, Julie; and Gerver, Howard, 291,844, Cl. D3-42.000.
Gerver, Julie; and Gerver, Howard. Portable footwear tote bagcu291,844, 9-15-87, Cl. D3-42.000.
Gillam, Paul A.: *See*—
Tucker, Roger; Gillam, Paul A.; Wright, Peter; Whitehouse, Donald; Broadbent, Michael C.; and Moran, Charles, 291,913, Cl. D23-97.000.
Glennon, Wayne P.; and Taylor, Mack E. Golf club putter headcu291,908, 9-15-87, Cl. D21-217.000.
GTE Products Corporation: *See*—
Blaisdell, Ronald G.; and Gagnon, Peter R., 291,921, Cl. D26-2.000.
Halpern, David: *See*—
Weisenfeld, George; and Halpern, David, 291,894, Cl. D16-123.000.
Hanson, Brian E.: *See*—
Hanson, Douglas M.; Hanson, Jeff D.; and Hanson, Brian E., 291,899, Cl. D21-23.000.
Hanson, Douglas M.; Hanson, Jeff D.; and Hanson, Brian E., to JMBL Corporation. Three-dimensional game boardcu291,899, 9-15-87, Cl. D21-23.000.
Hanson, Jeff D.: *See*—
Hanson, Douglas M.; Hanson, Jeff D.; and Hanson, Brian E., 291,899, Cl. D21-23.000.
Harvey, Warren L. Time displaycu291,871, 9-15-87, Cl. D10-126.000.
Hayakawa, Toshio; and Ohkuni, Shinichiro, to Bridgestone Corporation. Motorcycle tirecu291,874, 9-15-87, Cl. D12-147.000.
Hayakawa, Toshio; and Osawa, Toru, to Bridgestone Corporation. Automobile tirecu291,875, 9-15-87, Cl. D12-147.000.
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CLASS 91

216 B	4,693,171

CLASS 98

2.01	4,693,172
2.09	4,693,416
31.5	4,693,173
31.6	4,693,175
40.05	4,693,174
40.12	4,693,176

CLASS 100

154	4,693,177

CLASS 101

40	4,693,178
119	4,693,179

CLASS 102

274	4,693,180
307	4,693,181
476	4,693,182

CLASS 104

55	4,693,183
295	4,693,184

CLASS 105

199.2	4,693,185
329.1	4,693,186

CLASS 106

35	4,693,748
99	4,693,749
163.1	4,693,750
209	4,693,751
280	4,693,752
288 Q	4,693,753
290	4,693,754

CLASS 108

69	4,693,187
139	4,693,188

CLASS 110

347	4,693,189

CLASS 112

80.3	4,693,190
80.6	4,693,191
121.11	4,693,192
	4,693,193
199	4,693,194
262.1	4,693,195
273	4,693,196
277	4,693,197
443	4,693,198

CLASS 114

39	4,693,199
47	4,693,200
67 R	4,693,201
74 A	4,693,202
353	4,693,203
363	4,693,204

CLASS 118

13	4,693,205
213	4,693,209
259	4,693,210
631	4,693,206
715	4,693,207
724	4,693,208
725	4,693,211

CLASS 119

103	4,693,212

CLASS 122

7 R	4,693,213

CLASS 123

90.18	4,693,214
188 M	4,693,215
195 A	4,693,217
195 R	4,693,216
260	4,693,218
276	4,693,219
339	4,693,220
425	4,693,221
432	4,693,222
468	4,693,223
531	4,693,224
568	4,693,225
	4,693,226
575	4,693,227

CLASS 124

25	4,693,228
41 A	4,693,229
88	4,693,230

CLASS 125

23 T	4,693,232
116 D	4,693,231

CLASS 126

117	4,693,233
155	4,693,234
263	4,693,235

CLASS 128

1 R	4,693,236
	4,693,237
1.5	4,693,238
80 F	4,693,239
92 Z	4,693,240
157	4,693,241
204.26	4,693,242
207.15	4,693,243
303.1	4,693,244
305	4,693,245
321	4,693,246
328	4,693,247
334 C	4,693,248
334 R	4,693,249
345	4,693,250
346	4,693,251
400	4,693,252
419 D	4,693,253
421	4,693,254
654	4,693,255
663	4,693,319
725	4,693,256
752	4,693,257
783	4,693,258

CLASS 130

27 R	4,693,259

CLASS 131

84.1	4,693,260
	4,693,261
84.3	4,693,262
84.4	4,693,263
296	4,693,264
340	4,693,265
359	4,693,266

CLASS 134

4	4,693,755
7	4,693,756
27	4,693,757

CLASS 136

256	4,694,115
	4,694,116
	4,694,117

CLASS 137

13	4,693,321
116.5	4,693,267
219	4,693,268
512.1	4,693,269
514.3	4,693,270
565	4,693,271
596	4,693,272
596.13	4,693,273
625.4	4,693,274
625.65	4,693,275

CLASS 138

31	4,693,276
89	4,693,277
	4,693,278
108	4,693,279
118.1	4,693,280
174	4,693,281

CLASS 139

1 R	4,693,282

CLASS 141

1	4,693,283
	4,693,284
61	4,693,286
71	4,693,285

CLASS 144

2 Z	4,693,287
87	4,693,288

CLASS 148

4	4,693,760
9 R	4,693,761
111	4,693,762

CLASS 149

8	4,693,763
19.4	4,693,764
60	4,693,765

CLASS 150

52 R	4,693,289

CLASS 152

450	4,693,290

CLASS 156

49	4,693,767
62	4,693,768
64	4,693,766
73.1	4,693,769
73.3	4,693,771
79	4,693,772
151	4,693,770
200	4,693,773
215	4,693,774
272.4	4,693,775
327	4,693,776
345	4,693,777
361	4,693,778
638	4,693,779
643	4,693,780
	4,693,781
644	4,693,783
653	4,693,782

CLASS 160

388	4,693,291

CLASS 162

202	4,693,784
242	4,693,785

CLASS 164

34	4,693,292

99 4,693,293
312 4,693,294
433 4,693,295
440 4,693,296
447 4,693,297
486 4,693,298
502 4,693,299

CLASS 165

1 4,693,300
45 4,693,301
46 4,693,302
80.4 4,693,303
88 4,693,304
95 4,693,305
104.21 4,693,306
152 4,693,307

CLASS 166

55.1 4,693,308
123 4,693,309
270 4,693,310
272 4,693,311
279 4,693,312
302 4,693,313
317 4,693,314
336 4,693,315
355 4,693,316
378 4,693,317
380 4,693,318

CLASS 169

61 4,693,320

CLASS 173

116 4,693,322

CLASS 174

35 C 4,693,323
41 4,694,118
47 4,693,324
52 PE 4,694,119
68.5 4,694,120
4,694,121
106 R 4,694,122
117 FF 4,694,123

CLASS 175

55 4,693,325
4,693,326
61 4,693,327
273 4,693,328

CLASS 177

4 4,693,329
25 4,693,330

CLASS 178

19 4,694,124

CLASS 180

135 4,693,331
142 4,693,332
233 4,693,333
249 4,693,334

CLASS 181

102 4,693,335
111 4,693,336
231 4,693,337
4,693,338
255 4,693,339

CLASS 187

52 R 4,693,340

CLASS 188

72.7 4,693,341
79.5 K 4,693,342
322.17 4,693,343

CLASS 190

107 4,693,344
108 4,693,345
111 4,693,346

CLASS 191

87 4,694,125

CLASS 192

3.29 4,693,348
3.3 4,693,347
7 4,693,349
18 A 4,693,350
48.92 4,693,351
70.27 4,693,352
85 AA 4,693,353
106.1 4,693,354

CLASS 193

2 R 4,693,355
35 TE 4,693,356

CLASS 194

202 4,693,357

CLASS 198

339.1 4,693,358
474.1 4,693,359
509 4,693,360
621 4,693,361
803.7 4,693,362
807 4,693,363

CLASS 200

5 A 4,694,126
68.2 4,694,129
83 P 4,694,127
84 R 4,694,128
314 4,694,130

CLASS 202

83 4,693,786

CLASS 203

51 4,693,787
4,693,788
4,693,789

CLASS 204

1 T 4,693,790
11 4,693,791
25 4,693,792
78 4,693,793
84 4,693,794
94 4,693,795
98 4,693,796
128 4,693,797
149 4,693,798
165 4,693,799
180.1 4,693,800
180.2 4,693,801
182.1 4,693,804
182.4 4,693,802
192.22 4,693,805
252 4,693,806
298 4,693,803

CLASS 206

45.18 4,693,364
63.3 4,693,365
222 4,693,366
287.1 4,693,368
289 4,693,367
290 4,693,369
488 4,693,370
538 4,693,371
554 4,693,372

CLASS 208

108 4,693,807
113 4,693,808
127 4,693,809
321 4,693,810

CLASS 209

3.3 4,693,373
139.2 4,693,811
224 4,693,812
535 4,693,374
544 4,693,375
552 4,693,376
579 4,693,377
586 4,693,378
674 4,693,379

CLASS 210

88 4,693,814
107 4,693,815
150 4,693,816
169 4,693,817
189 4,693,818
202 4,693,819
232 4,693,820
241 4,693,821
255 4,693,822
266 4,693,823
500.28 4,693,824
4,693,825
512.1 4,693,826
614 4,693,827
679 4,693,828
697 4,693,829
734 4,693,830
744 4,693,831
756 4,693,832
759 4,693,833
767 4,693,834
777 4,693,835
791 4,693,836

CLASS 211

35 4,693,380
94 4,693,381
189 4,693,382
192 4,693,383

CLASS 212

257 4,693,384

CLASS 215

232 4,693,385

CLASS 219

10.41 4,694,131
10.55 F 4,694,132
10.55 M 4,694,133
10.79 4,694,134
110 4,694,135
121 LC 4,694,137
121 LD 4,694,136
121 LM 4,694,138
121 LU 4,694,139
130.1 4,694,140
147 4,694,141
371 4,694,142
388 4,694,143
497 4,694,145
522 4,694,144
524 4,694,146

CLASS 220

1.5 4,693,386
6 4,693,387
8 4,693,388
236 4,693,389
343 4,693,392
359 4,693,390
4,693,391
374 4,693,393

CLASS 222

1 4,693,394
107 4,693,395
4,693,396
137 4,693,397
327 4,693,398
480 4,693,399
518 4,693,400
607 4,693,401

CLASS 224

215 4,693,402

CLASS 225

2 4,693,403
103 4,693,404

CLASS 226

91 4,693,405

CLASS 227

63 4,693,406
109 4,693,407

CLASS 228

47 4,693,408
122 4,693,409

CLASS 229

1.5 B 4,693,410
23 R 4,693,411
40 4,693,412
48 R 4,693,413
125.02 4,693,414

CLASS 235

379 4,694,147
468 4,694,148

CLASS 236

12.12 4,693,415

CLASS 237

12.3 B 4,693,417

CLASS 238

10 R 4,693,418

CLASS 239

63 4,693,419
87 4,693,420
129 4,693,421
195 4,693,422
332 4,693,423
453 4,693,424
735 4,693,425

CLASS 241

18 4,693,426
23 4,693,427
167 4,693,428

CLASS 242

18 G 4,693,429
18 R 4,693,430
58.6 4,693,433
72 B 4,693,431
74 4,693,432

CLASS 244

91 4,693,435
149 4,693,436
225 4,693,437
328 4,693,434

CLASS 248

27.3 4,693,438
37.6 4,693,439
154 4,693,440
225.1 4,693,441
406.2 4,693,442
447.1 4,693,443
653 4,693,444

CLASS 249

19 4,693,445
53 R 4,693,446
162 4,693,448
210 4,693,449

CLASS 250

201 4,694,149
4,694,150
4,694,151
4,694,152
202 4,694,153
213 VT 4,694,154
214 C 4,694,157
214 R 4,694,155
214 RC 4,694,156
223 B 4,694,158
227 4,694,159
4,694,160
231 R 4,694,161
4,694,162
234 4,694,163
4,694,164
252.1 4,694,165
261 4,694,166
282 4,694,167
287 4,694,168
296 4,694,169
309 4,694,170
311 4,694,171
339 4,694,172
343 4,694,173
345 4,694,174
352 4,694,175
362 4,694,176
368 4,694,177
396 R 4,694,178
431 4,694,179
455.1 4,694,180
548 4,694,181
551 4,694,183
561 4,694,184
566 4,694,182
578 4,694,185
4,694,186

CLASS 251

121 4,693,450
129.12 4,693,447
163 4,693,451
329 4,693,452

CLASS 252

50 4,693,837
51.5 A 4,693,839
51.5 R 4,693,838
174.23 4,693,840
299.62 4,693,841
356 4,693,842
518 4,693,843

CLASS 254

323 4,693,453

CLASS 260

97 4,693,846
104 4,693,847
402 4,693,848
404 4,693,849
506 4,693,850
544 D 4,693,851

CLASS 261

30 4,693,852
39.1 4,693,853
84 4,693,854

CLASS 264

40.7 4,693,855
45.4 4,693,856
56 4,693,857
101 4,693,858
112 4,693,859
320 4,693,860
328.1 4,693,861

CLASS 267

140.1 4,693,455
4,693,456
153 4,693,457
226 4,693,454

CLASS 269

21 4,693,458

CLASS 271

9 4,693,459
10 4,693,460
176 4,693,461
183 4,693,462
236 4,693,463
265 4,693,464
274 4,693,465

CLASS 272

52 4,693,466
4,693,467
73 4,693,468
74 4,693,469
96 4,693,470
136 4,693,471

CLASS 273

29 A 4,693,472
32 F 4,693,473
73 C 4,693,474
73 J 4,693,475
110 4,693,476
143 R 4,693,477
164 4,693,478
186 A 4,693,479
296 4,693,480

CLASS 277

96.2 4,693,481
207 A 4,693,482
4,693,483
212 FB 4,693,484

CLASS 280

6 R 4,693,485
80 R 4,693,486
96.1 4,693,487
293 4,693,488
634 4,693,489
650 4,693,490
688 4,693,491
705 4,693,492
707 4,693,493
4,693,494
808 4,693,495

CLASS 283

102 4,693,496

CLASS 285

12 4,693,497
39 4,693,498
94 4,693,500
96 4,693,499
173 4,693,501
334.5 4,693,502

CLASS 290

4 R 4,694,187
40 B 4,694,188
40 C 4,694,189
52 4,694,190

CLASS 292

210 4,693,503

CLASS 294

1.1 4,693,504
119.1 4,693,505

CLASS 296

1 S 4,693,506
39 R 4,693,507
100 4,693,508
201 4,693,509

CLASS 297

39 4,693,510
219 4,693,511
277 4,693,512
284 4,693,513
374 4,693,514
391 4,693,515
4,693,516

CLASS 299

87 4,693,517
93 4,693,518

CLASS 300

7 4,693,519

CLASS 301

37 SS 4,693,520

CLASS 303

103 4,693,521
105 4,693,522
114 4,693,523

CLASS 307

10 LS 4,694,191
39 4,694,192
62 4,694,193
66 4,694,194
234 4,694,195
269 4,694,196
4,694,197
290 4,694,198
297 4,694,199
358 4,694,200
446 4,694,203
475 4,694,201
4,694,202
494 4,694,204
530 4,694,205
571 4,694,206
4,694,207
603 4,694,208

CLASS 310

12 4,694,209
68 R 4,694,210
71 4,694,211
90 4,694,212
4,694,213
239 4,694,214

CLASS 312

140 4,693,524
208 4,693,525
250 4,693,526

CLASS 313

44 4,694,215
402 4,694,216
468 4,694,217
478 4,694,218
636 4,694,219

CLASS 315

10 4,694,220
4,694,221
111.21 4,694,222
118 4,694,223
177 4,694,224
366 4,694,225
408 4,694,226

CLASS 318

80 4,694,227
341 4,694,228
561 4,694,229
568 4,694,230
4,694,231
4,694,232
569 4,694,233
603 4,694,234
662 4,694,235
798 4,694,236

CLASS 320

6 4,694,237

CLASS 322

28 4,694,238

CLASS 323

285 4,694,239
4,694,240
340 4,694,241

CLASS 324

73 R 4,694,242
96 4,694,243
121 R 4,694,244
158 F 4,694,245
207 4,694,246
216 4,694,247
252 4,694,248
309 4,694,249
4,694,250
4,694,251
4,694,252
4,694,253
4,694,254
318 4,694,255

CLASS 328

120 4,694,256

CLASS 329

50 4,694,257

CLASS 330

2 4,694,258

CLASS 331

1 A 4,694,259
9 4,694,260
57 4,694,261
96 4,694,262

CLASS 332

20 4,694,263

CLASS 333

34 4,694,264
185 4,694,265
196 4,694,266
248 4,694,267

CLASS 335

216 4,694,268
4,694,269
260 4,694,270
302 4,694,271

CLASS 338

138 4,694,272

CLASS 340

58 4,694,273
146.2 4,694,274
347 AD 4,694,276
347 DD 4,694,278
347 NT 4,694,277
347 P 4,694,275
4,694,279
365 R 4,694,280

521 4,694,281
539 4,694,282
572 4,694,283
574 4,694,284
693 4,694,285
703 4,694,286
719 4,694,287
721 4,694,288
815.05 4,694,289
815.21 4,694,290
825.14 4,694,294
825.2 4,694,291
825.44 4,694,292
825.68 4,694,293
903 4,694,295
904 4,694,296

CLASS 342

45 4,694,297
89 4,694,298
170 4,694,299
195 4,694,300

CLASS 343

720 4,694,301

CLASS 346

1.1 4,694,302
4,694,303
7 4,694,304
76 PH 4,694,305
140 R 4,694,306
4,694,307
4,694,308
153.1 4,694,310

CLASS 350

96.11 4,693,543
96.12 4,693,545
96.13 4,693,546
4,693,547
4,693,548
96.14 4,693,549
96.16 4,693,544
96.20 4,693,550
96.23 4,693,551
96.24 4,693,552
96.34 4,693,553
244 4,693,554
253 4,693,555
320 4,693,556
331 R 4,693,557
332 4,693,558
334 4,693,559
335 4,693,560
336 4,693,561
337 4,693,562
350 S 4,693,563
357 4,693,564
413 4,693,565
427 4,693,566
433 4,693,567
469 4,693,568
505 4,693,569
616 4,693,570
634 4,693,571

CLASS 351

161 4,693,572
204 4,693,573

CLASS 354

21 4,693,574
82 4,693,575
86 4,693,576
155 4,693,577
173.1 4,693,578
4,693,579
271.1 4,693,580
400 4,693,581
403 4,693,582
439 4,693,583
446 4,693,584

CLASS 355

3 FU 4,693,585
4,693,587
3 R 4,693,588
3 SH 4,693,586
5 4,693,589
14 CH 4,693,593
14 E 4,693,592
14 SH 4,693,590
25 4,693,594
41 4,693,591
77 4,693,595
4,693,596

CLASS 356

1 4,693,597
4 4,693,598
121 4,693,599
4,693,600
237 4,693,601
336 4,693,602
346 4,693,603
348 4,693,604
349 4,693,605
355 4,693,606
380 4,693,607
394 4,693,608

CLASS 357

17 4,694,311
4,694,312
23.13 4,694,315
23.4 4,694,313
23.6 4,694,314
24 4,694,316
30 4,694,317
4,694,318
38 4,694,319
40 4,694,320
48 4,694,321
74 4,694,322
82 4,694,323

CLASS 358

10 4,694,324
11 4,694,325
19 4,694,326
4,694,327
21 V 4,694,328
22 4,694,329
27 4,694,330
31 4,694,331
75 4,694,332
113 4,694,333
4,694,334
133 4,694,336
140 4,694,337
141 4,694,338
148 4,694,339
154 4,694,340
160 4,694,341
167 4,694,342
183 4,694,343
4,694,344
216 4,694,345
218 4,694,346
236 4,694,347
4,694,348
241 4,694,349
242 4,694,350
256 4,694,351
257 4,694,352
283 4,694,353
296 4,694,354
332 4,694,355
4,694,356

CLASS 360

9.1 4,694,357
59 4,694,358
76 4,694,359
96.5 4,694,360
97 4,694,361
4,694,362
99 4,694,363
4,694,364
100 4,694,365
106 4,694,366
4,694,367
126 4,694,368
132 4,694,369
133 4,694,370

CLASS 361

23 4,694,371
86 4,694,372
96 4,694,373
4,694,374
212 4,694,375
235 4,694,376
257 Re.32,505
275 4,694,377
385 4,694,378
424 4,694,380

CLASS 362

307 4,694,381
346 4,694,382

CLASS 363

17 4,694,383
4,694,384
19 4,694,385
49 4,694,386
56 4,694,387
72 4,694,388
132 4,694,389

CLASS 364

165 4,694,390
200 4,694,391
4,694,392
4,694,393
4,694,394
4,694,395
300 4,694,396
408 4,694,397
414 4,694,398
4,694,399
475 4,694,401
487 4,694,402
488 4,694,403
518 4,694,404
4,694,405
4,694,406
4,694,407
551 4,694,408
558 4,694,409
4,694,410
578 4,694,411
717 4,694,412
724 4,694,413
4,694,414
4,694,415
736 4,694,416
752 4,694,417
807 4,694,418
900 4,694,419
4,694,420
4,694,421
4,694,422

CLASS 365

2 4,694,423
12 4,694,424
49 4,694,425
78 4,694,426
185 4,694,427
189 4,694,428
4,694,429
4,694,430
4,694,431
203 4,694,432
230 4,694,433

CLASS 366

136 4,693,609
146 4,693,610
195 4,693,611

CLASS 367

7 4,694,434
17 4,694,435
20 4,694,436
27 4,694,437
70 4,694,438
83 4,694,439
152 4,694,440
419 4,694,379

CLASS 368

74 4,693,612
238 4,693,613

CLASS 369

32 4,694,441
44 4,694,442
46 4,694,443
65 4,694,444
4,694,445
67 4,694,446
110 4,694,447
246 4,694,449
291 4,694,448

CLASS 370

32.1 4,694,450
4,694,451
58 4,694,452
85 4,694,453

CLASS 371

13 4,694,454
37 4,694,455
38 4,694,456

CLASS 372

2 4,694,457
32 4,694,458
45 4,694,459
4,694,460
50 4,694,461
61 4,694,462
4,694,463

CLASS 373

22 4,694,464
81 4,694,465

CLASS 374

122 4,693,614
129 4,693,615

CLASS 375

1 4,694,466
4,694,467
10 4,694,468
13 4,694,469
37 4,694,470
45 4,694,471
107 4,694,472
116 4,694,473

CLASS 376

209 4,693,862

CLASS 377

6 4,694,474
48 4,694,475
58 4,694,476

CLASS 378

34 4,694,477
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58 4,694,479
119 4,694,480
198 4,694,481

CLASS 379

27 4,694,482
34 4,694,483
59 4,694,484
62 4,694,485
110 4,694,486
269 4,694,487
327 4,694,488

CLASS 380

10 4,694,489
14 4,694,335
20 4,694,490
4,694,491
23 4,694,492

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10 4,694,500
15 4,694,495
4,694,501
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51 4,694,494
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63 4,694,497
103 4,694,498
155 4,694,499

CLASS 382

17 4,694,502

CLASS 383

12 4,694,503

CLASS 384

99 4,693,616
282 4,693,617

CLASS 400

120 4,693,618
212 4,693,619
611 4,693,620
636.1 4,693,621

CLASS 401

191 4,693,622
206 4,693,623

CLASS 402

22 4,693,624
27 4,693,625
73 4,693,626

CLASS 403

24 4,693,627
135 4,693,628
170 4,693,629
405.1 4,693,630

CLASS 405

18 4,693,632
26 4,693,631
119 4,693,633
126 4,693,634
132 4,693,635
169 4,693,636
224 4,693,637
259 4,693,638
263 4,693,639
294 4,693,640

CLASS 407

42 4,693,641

CLASS 408

59 4,693,642
82 4,693,643
204 4,693,644

CLASS 409

86 4,693,645
136 4,693,646
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178 4,693,648
244 4,693,813
293 4,693,649

CLASS 410

18 4,693,650
30 4,693,651

CLASS 411

23 4,693,652
387 4,693,653
4,693,654
429 4,693,655
433 4,693,656
467 4,693,657

CLASS 413

1 4,693,658

CLASS 414

131 4,693,659
458 4,693,660
595 4,693,661
695 4,693,662
735 4,693,663
4,693,664
744 R 4,693,665
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CLASS 415

115 4,693,667
138 4,693,668
143 4,693,669

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43 4,693,671
174 4,693,672
199 4,693,673

CLASS 417

269 4,693,674
489 4,693,675

CLASS 419

13 4,693,863
23 4,693,864
36 B1 4,225,345

CLASS 420

572 4,693,865

CLASS 422

13 4,693,866
64 4,693,867
124 4,693,868
186.04 4,693,869
186.19 4,693,870

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215.5 4,693,873
235 4,693,874
243 4,693,875
300 4,693,876
334 4,693,878
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373 4,693,877
461 4,693,879
515 4,693,880
573 R 4,693,881
648 R 4,693,883
652 4,693,882

CLASS 424

1.1 4,693,884
2 4,693,885
15 4,693,886
19 4,693,887
49 4,693,888
78 4,693,890
83 4,693,889
89 4,693,893
92 4,693,891
150 4,693,894
456 4,693,892
473 4,693,895
480 4,693,896

CLASS 425

145 4,693,676
376 R 4,693,677
405 R 4,693,678
589 4,693,679

CLASS 426

2 4,693,897
19 4,693,898
94 4,693,899
128 4,693,900
330.6 4,693,901
407 4,693,902
456 4,693,903
521 4,693,904
599 4,693,905

CLASS 427

69 4,693,906
97 4,693,907
130 4,693,908
156 4,693,909
168 4,693,910
196 4,693,911
213.3 4,693,912
215 4,693,913
255 4,693,914
256 4,693,915
397.7 4,693,916

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6 4,693,917
35 4,693,918
36 4,693,919
40 4,693,920
100 4,693,921
134 4,693,922
148 4,693,923
170 4,693,924
189 4,693,925
204 4,693,926
216 4,693,927
236 4,693,928
323 4,693,929
4,693,930
4,693,932
328 4,693,931
333 4,693,933
336 4,693,934
352 4,693,935
383 4,693,936
389 4,693,937
403 4,693,938
421 4,693,939
422 4,693,940
480 4,693,941
614 4,693,942
678 4,693,943
698 4,693,944

CLASS 429

31 4,693,945
27 4,693,946
51 4,693,947
121 4,693,948
178 4,693,949
194 4,693,950

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165 4,693,953
203 4,693,954
204 4,693,955
264 4,693,956
269 4,693,957
302 4,693,958
323 4,693,959
4,693,960
325 4,693,961
345 4,693,962
499 4,693,963
505 4,693,964
569 4,693,965

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10 4,693,680
324 4,693,681

CLASS 432

15 4,693,682

CLASS 433

37 4,693,683
90 4,693,684
105 4,693,685
116 4,693,871
173 4,693,686

CLASS 434

302 4,693,687

CLASS 435

7 4,693,966
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4,693,969
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68 4,693,973
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172.2 4,693,975
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174 4,693,758
175 4,692,991
225 4,692,998
238 4,692,997

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350	4,693,533
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594	4,693,532
626	4,693,542
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129	4,693,691
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80	4,693,700
CLASS 493	
204	4,693,701
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61	4,693,702
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89	4,693,988
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116	4,693,990
220	4,693,991
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9	4,693,845
14	4,693,844
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11	4,693,992
14	4,693,993
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44	4,693,995
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161	4,694,024
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228	4,694,004
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260	4,694,007
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304	4,694,010
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345	4,694,013
363	4,694,014
375	4,694,015
380	4,694,016
418	4,694,017
427	4,694,018
461	4,694,019
535	4,694,020
544	4,694,021
554	4,694,022
559	4,694,023
CLASS 521	
88	4,694,025
94	4,694,026
	4,694,027
110	4,694,028
CLASS 522	
8	4,694,029
CLASS 523	
179	4,694,030
203	4,694,031
334	4,694,032
437	4,694,033
503	4,694,034
CLASS 524	
458	4,694,035
473	4,694,036
557	4,694,037
590	4,694,038
718	4,694,039
765	4,694,040
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25	4,694,041
66	4,694,042
127	4,694,043
178	4,694,044
276	4,694,045
329.4	4,694,046
332.3	4,694,047
376	4,694,048
411	4,694,050
437	4,694,051
440	4,694,049
454	4,694,052
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74	4,694,053
93	4,694,054
201	4,694,055
202	4,694,056
206	4,694,057
307.2	4,694,058
340.3	4,694,059
CLASS 528	
14	4,694,060
15	Re.32,504
125	4,694,061
232	4,694,062
315	4,694,063
332	4,694,064
371	4,694,065
373	4,694,066
393	4,694,067
502	4,694,068
CLASS 530	
317	4,694,069
329	4,694,070
	4,694,071
350	4,694,072
399	4,694,073
417	4,694,074
CLASS 534	
604	4,694,075
CLASS 536	
17.2	4,694,076
92	4,694,077
CLASS 540	
141	4,694,078
215	4,694,079
CLASS 544	
49	4,694,080
385	4,694,081
	4,694,082
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14	4,694,083
25	4,694,084
65	4,694,085
CLASS 548	
321	4,694,087
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226	4,694,088
239	4,694,089
407	4,694,090
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104	4,694,091
400	4,694,092
413	4,694,093
CLASS 558	
76	4,694,094
186	4,694,095
251	4,694,096
CLASS 560	
24	4,694,097
59	4,694,098
75	4,694,099
105	4,694,100
352	4,694,101
CLASS 562	
426	4,694,102
450	4,694,103
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236	4,694,086
285	4,694,104
430	4,694,105
CLASS 568	
38	4,694,106
310	4,694,107
387	4,694,108
454	4,694,109
638	4,694,110
662	4,694,111
842	4,694,112
863	4,694,113
CLASS 585	
481	4,694,114
CLASS 604	
49	4,693,703
55	4,693,704
	4,693,705
87	4,693,706
111	4,693,707
198	4,693,708
212	4,693,709
283	4,693,710
306	4,693,711
323	4,693,712
368	4,693,713
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3	4,693,714
5	4,693,715
6	4,693,716
	4,693,717
11	4,693,718
	4,693,719
	4,693,720
16	4,693,721
18	4,693,722
19	4,693,723
23	4,693,724

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D2—	248	291,840
D3—	26	291,841
	36	291,842
	38	291,843
	42	291,844
D5—	56	291,845
D6—	344	291,846
	381	291,847
	466	291,848
	471	291,849
		291,850
	482	291,851
	487	291,852
	511	291,853
D7—	30	291,856
	49	291,857
	77	291,858
	321	291,859
	360	291,860
	402	291,854
	404	291,855
D8—	37	291,861
	107	291,862
		291,863
	354	291,864
D9—	322	291,865
	337	291,866
	430	291,867
	453	291,868
D10—	32	291,869
	114	291,870
	126	291,871
D12—	96	291,872
	111	291,873
	147	291,874
		291,875
	149	291,876
	151	291,877
	156	291,878
	192	291,880
	209	291,879
	300	291,881
D14—	3	291,882
	53	291,883
	60	291,884
	63	291,885
	68	291,886
	79	291,887
	95	291,888
D15—	139	291,889
	199	291,890
D16—	14	291,891
	30	291,892
	102	291,893
	123	291,894
	134	291,895
D20—	5	291,896
	22	291,897
	24	291,898
D21—	23	291,899
	54	291,900
	86	291,901
	161	291,906
	213	291,907
	217	291,908
	219	291,902
	230	291,909
	237	291,910
D22—	107	291,903
		291,904
	146	291,905
D23—	1	291,911
	35	291,912
	97	291,913
	112	291,914
D24—	2	291,915
		291,916
		291,917
	8	291,918
	10	291,919
	56	291,920
D26—	2	291,921
	14	291,922
	28	291,923
		291,924
	61	291,925
	67	291,926
	73	291,927
	76	291,928
	138	291,929
D28—	59	291,930
		291,931
D32—	4	291,932
	14	291,933
	70	291,934
D34—	38	291,935
D99—	28	291,936
	30	291,937
	40	291,938
		291,939

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P.—	9	6,011
	22	6,010
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		6,013
		6,014
		6,015
	88	6,016

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01 :	4,692,978	4,693,557	4,694,405	4,694,299	4,693,035	4,693,786
	4,693,444	4,693,560	4,694,408	4,694,357	4,693,073	4,693,936
	4,693,460	4,693,602	4,694,412	4,694,397	4,693,094	4,693,992
	4,693,561	4,693,603	4,694,424	4,694,450	4,693,108	4,694,016
	4,693,718	4,693,607	4,694,439	10 : 4,693,045	4,693,200	4,694,226
04 :	4,693,022	4,693,629	4,694,459	4,693,109	4,693,209	4,694,414
	4,693,090	4,693,636	4,694,462	4,693,715	4,693,247	4,694,499
	4,693,189	4,693,659	4,694,468	4,693,743	4,693,249	19 : 4,692,968
	4,693,382	4,693,683	4,694,477	4,693,744	4,693,296	4,693,132
	4,693,443	4,693,696	4,694,480	4,693,749	4,693,349	4,693,438
	4,693,650	4,693,717	4,694,501	4,693,941	4,693,352	4,693,699
	4,693,852	4,693,728	4,225,345	4,694,013	4,693,376	4,693,720
	4,694,241	4,693,764	08 : 4,693,014	4,694,045	4,693,387	4,694,237
	4,694,242	4,693,806	4,693,178	4,694,054	4,693,412	20 : 4,693,402
	4,694,300	4,693,820	4,693,310	11 : 4,693,299	4,693,428	4,693,406
	4,694,447	4,693,851	4,693,340	4,693,606	4,693,465	4,693,426
05 :	4,693,280	4,693,886	4,693,368	4,694,285	4,693,532	4,693,541
	4,693,384	4,693,891	4,693,381	12 : 4,692,948	4,693,536	21 : 4,693,034
06 :	4,692,949	4,693,893	4,693,708	4,692,965	4,693,550	4,693,638
	4,692,950	4,693,895	4,693,755	4,692,971	4,693,572	22 : 4,692,954
	4,692,963	4,693,908	4,693,805	4,693,024	4,693,611	4,693,055
	4,692,976	4,693,925	4,693,993	4,693,025	4,693,654	4,693,102
	4,692,993	4,693,938	4,694,159	4,693,049	4,693,682	4,693,128
	4,693,001	4,693,940	4,694,179	4,693,075	4,693,698	4,693,243
	4,693,008	4,693,981	4,694,181	4,693,167	4,693,703	4,693,271
	4,693,072	4,694,115	4,694,244	4,693,228	4,693,707	4,693,861
	4,693,086	4,694,123	4,694,334	4,693,257	4,693,712	4,693,967
	4,693,089	4,694,130	4,694,335	4,693,350	4,693,732	4,694,174
	4,693,097	4,694,132	4,694,343	4,693,380	4,693,737	23 : 4,694,488
	4,693,104	4,694,140	4,694,344	4,693,439	4,693,768	24 : 4,693,056
	4,693,119	4,694,146	4,694,358	4,693,669	4,693,774	4,693,403
	4,693,206	4,694,153	4,694,367	4,693,864	4,693,818	4,693,476
	4,693,237	4,694,156	09 : 4,692,957	4,694,070	4,693,831	4,693,600
	4,693,239	4,694,161	4,692,986	4,694,118	4,693,869	4,693,906
	4,693,250	4,694,162	4,693,003	4,694,295	4,693,883	4,693,958
	4,693,281	4,694,165	4,693,179	4,694,313	4,693,889	4,693,984
	4,693,323	4,694,173	4,693,390	13 : 4,693,113	4,694,018	4,693,994
	4,693,325	4,694,175	4,693,391	4,693,124	4,694,122	4,694,021
	4,693,326	4,694,176	4,693,435	4,693,170	4,694,127	4,694,101
	4,693,327	4,694,183	4,693,549	4,693,427	4,694,192	4,694,195
	4,693,344	4,694,205	4,693,569	4,693,478	4,694,236	4,166,328
	4,693,365	4,694,222	4,693,605	4,693,480	4,694,280	25 : 4,692,946
	4,693,373	4,694,227	4,693,702	4,693,722	4,694,328	4,692,956
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	4,693,433	4,694,269	4,693,802	4,693,847	4,694,484	4,693,165
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	4,693,437	4,694,304	4,693,899	15 : 4,692,959	4,694,489	4,693,246
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	4,693,447	4,694,368	4,693,937	17 : 4,692,964	4,692,970	4,693,289
	4,693,449	4,694,369	4,693,960	4,692,966	4,693,077	4,693,504
	4,693,479	4,694,389	4,694,087	4,692,980	4,693,125	4,693,546
	4,693,496	4,694,395	4,694,113	4,693,012	4,693,276	4,693,547
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6,011

39 : 6,013

48 : 6,016

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